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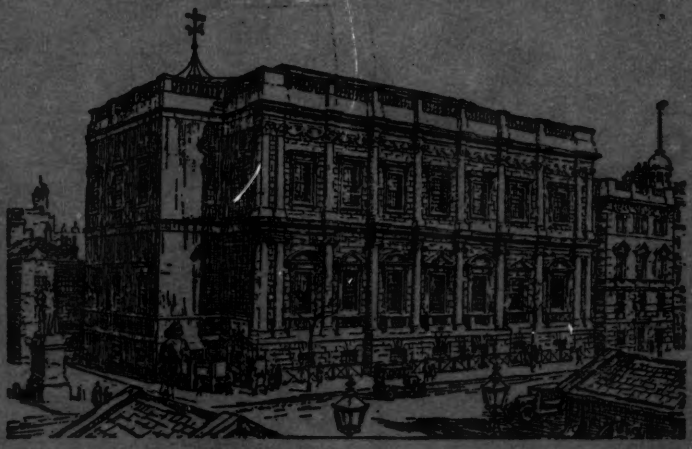

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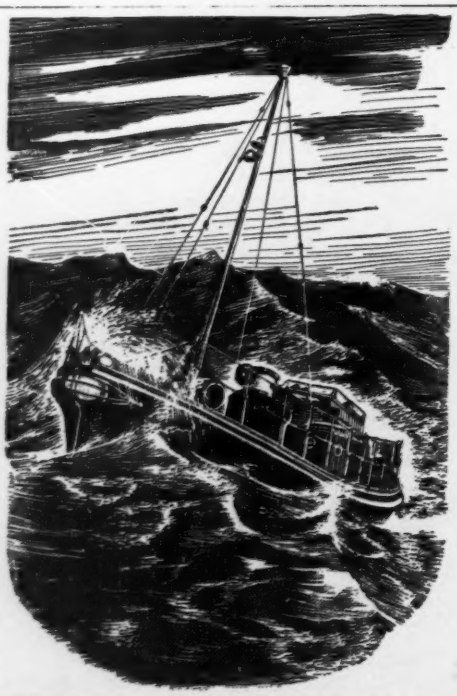

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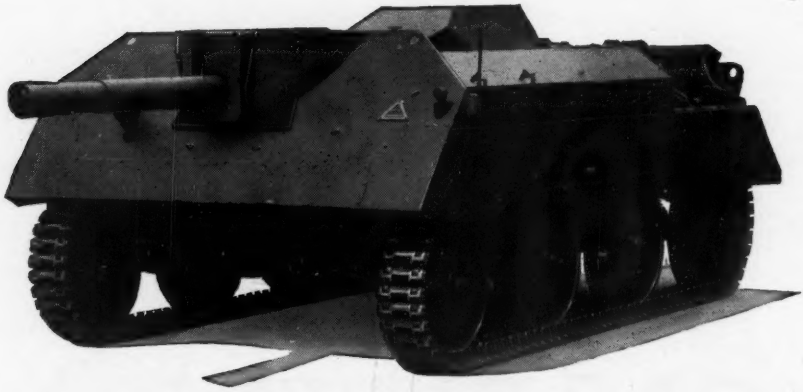

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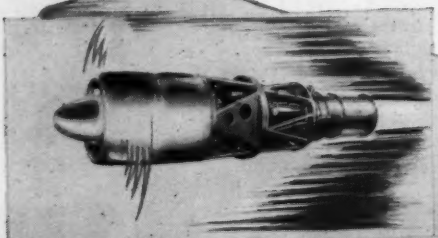

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SECRETARY'S NOTES

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Vice-Presidents

The Council, with much regret, have to record the death of Field-Marshal The Earl Wavell, P.C., G.C.B., G.C.S.I., G.C.I.E., C.M.G., M.C.

Marshal of the Royal Air Force Sir Edward Ellington, G.C.B., C.M.G., C.B.E., has been elected for a further term as a Vice-President.

Elected Member

Admiral Sir Arthur J. Power, G.C.B., G.B.E., C.V.O., has been elected a Naval Member of the Council in the vacancy caused by the election of Admiral Sir Charles Little as a Vice-President.

Representative Members

The Assistant Chief of the Air Staff (Training) will in future be the Air Ministry Representative on the Council, instead of the Director of Staff Training. Air Vice-Marshal S. D. Macdonald, C.B.E., D.F.C., has therefore succeeded Group Captain D. I. Coote in this capacity.

Death of a Former Vice-President

The Council have noted with much regret the death of Field-Marshal Lord Chetwode, G.C.B., O.M., G.C.S.I., K.C.M.G., D.S.O., a Vice-President of the Institution from 1935–1947.

Death of a Former Chairman of the Council

The Council have noted with much regret the death of General Sir Robert Whigham, G.C.B., K.C.M.G., D.S.O., Chairman of the Council in 1934–35.

NEW MEMBERS

The following officers joined the Institution between 1st May and 31st July, 1950 :—

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Lieutenant B. A. S. Clavering, late R.N.V.R.
Mr. G. V. Galwey, late Midshipman, R.N.
Lieutenant A. J. Parker, Royal Marines.
Sub-Lieutenant (E) A. Wyatt, R.N.
Lieutenant-Commander E. L. Cook, D.S.C., R.N.
Lieutenant-Commander A. A. Diggens, D.S.C., R.N.
Lieutenant C. J. Smith, Royal Marines.
Lieutenant-Commander J. D. O. Hinton, R.N.
Commander G. M. S. Stitt, R.N.
Admiral Sir Arthur J. Power, G.C.B., G.B.E., C.V.O.
Captain W. W. Sitwell, R.N.
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ARMY

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Major K. J. F. Nailer, Royal Artillery.
Captain J. T. Paget, Coldstream Guards.
Captain D. S. Wooles, R.A.S.C.
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Major T. W. Tinsley, Royal Engineers.
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Captain D. Wright, R.A.S.C.
Major R. W. Butler, R.E.M.E.
Captain C. U. Blascheck, M.C., The Royal Berkshire Regiment.
Lieut.-Colonel G. G. Russell, D.S.O., late King Edward's Horse.
Captain R. H. Borthwick, Royal Signals.
Colonel G. M. Gibson, late The Essex Regiment.
Lieut.-Colonel N. C. Robertson-Glasgow, The Royal Inniskilling Fusiliers.
Captain A. T. Taylor, The Durham Light Infantry.
Major C. R. Davis, The Gloucestershire Regiment.
Lieutenant D. J. Harding, 5th Regiment, R.H.A.
Lieutenant A. W. Harris, The Royal Norfolk Regiment.
Lieut.-Colonel Noor Hussain, Royal Pakistan Army.
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Brigadier R. W. Urquhart, D.S.O., Royal Engineers.
Captain E. J. M. Lawn, Royal Artillery.
Major D. A. Beckett, D.S.O., The Essex Regiment.
Major John Winchcombe-Taylor, C.M., late Royal Canadian Army.
Major J. L. L. Hillard, late Indian Army.
Lieutenant T. E. Cutts, late R.E.M.E.

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2nd Lieutenant J. D. Blackwell, Royal Tank Regiment.

On the recommendation of the Commandant, Royal Air Force College, Cranwell, the following officer has been awarded five years free membership of the Institution :—

Pilot Officer E. V. Mellor, R.A.F.

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The following alterations or additions to the list of Liaison Officers as published in February and amended in May have taken place :—

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Staff College, Camberley	Colonel H. T. Alexander, O.B.E.
ROYAL AIR FORCE	
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Reserve Command	Air Commodore T. B. Prickman, C.B.E.

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ADDITIONS

A lantern used by Florence Nightingale when attending patients in the hospital at Scutari, Crimea (3707). Lent by the Rev. J. C. Bracebridge.

The masthead pennant of H.M.S. " Queen Elizabeth " which was hauled down on her final paying off, 15th May, 1948 (9463). Presented by the Admiralty.

An officer's cap badge of the 5th (Cinque Ports) Battalion, Royal Sussex Regiment T.A., (9468). Presented by Captain R. B. Hale.

A medallion which belonged to Commander S. T. Hood, commemorating the capture of Cattaro in 1813 (9469). Presented by Lieut.-Colonel C. V. Wright, D.S.O.

A print from an engraving of Admiral Sir Francis Drake (9470) and the reproduction of a document bearing facsimiles of the signatures of the English Commanders who fought the Armada (9471), both framed in wood from the Spanish galleon sunk in Tobermory Bay. Presented by Mrs. R. Hopwood and Mrs. Noble.

A coatee (9472) and a pair of epaulettes (9473) worn by Field-Marshal the Duke of Wellington as Colonel of the 1st Grenadier Guards. A pair of Field-Marshal's epaulettes worn by the Duke of Wellington (9474) and a Field-Marshal's cocked hat with plume worn by the Duke of Wellington (9475). Presented by Mr. A. E. Collins.

JOURNAL

Members are invited to offer suitable contributions for the JOURNAL. Confidential matter cannot be used, but there is ample scope for professional articles which contain useful lessons of the War; also contributions of a general Service character, such as Strategic Principles, Command and Leadership, Morale, Staff Work, Naval, Military and Air Force History, Customs and Traditions.

The Editor is authorized to receive articles from serving officers and, if found suitable, to obtain permission for their publication from the appropriate Service Department.

Army Officers are reminded that such articles must be accompanied by the written approval of the author's Commanding Officer.

REQUEST FOR BACK NUMBERS

The Editor will be grateful if Members who have finished with them will return copies of the JOURNAL for August, 1942, February, 1946, and February and May, 1949.

CHANGES OF ADDRESS

Members are particularly requested to notify any change of address which will affect the dispatch of the JOURNAL.

Naval Officers are strongly advised to keep the Institution informed of their address, as JOURNALS sent to them via C.W. Branch of the Admiralty are invariably greatly delayed.

CHRISTMAS CARDS

Christmas cards, specially designed for Members of the Institution, will be on sale shortly, and orders can now be booked.

Card A is a reproduction in colours of a picture of the Review of the Fleet at Spithead in 1854, with the garrison of a Portsmouth fort firing a salute. The price, including envelopes, is 15s. per dozen.

Card B has the crest of the Institution on the outside and inside is a reproduction of a black and white sketch of the exterior of the Banqueting House. The price, including envelopes, is 9s. per dozen.

Postage in each case is 6d. for one dozen, and 2d. extra for each additional dozen.

Members are requested to make early application for the number of cards they require, stating which design, A or B, and enclosing the requisite remittance with their order.

FOR SALE

WHAT TO READ

The articles in the JOURNAL on " What to Read " have been published in pamphlet form. Copies can be supplied, price 1s. 6d. post free.

THE STRATEGY OF THE SOUTH-EAST ASIA CAMPAIGN

Copies of the above-named lecture by Admiral Earl Mountbatten of Burma, with the appropriate pull-out map, are available, price 2s. 6d. post free.

THE CHESNEY GOLD MEDAL

THE JOURNAL

of the

Royal United Service Institution

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PRESENTATION OF THE CHESNEY GOLD MEDAL TO THE RT. HON. WINSTON S. CHURCHILL, O.M., C.H., M.P.

ON TUESDAY, 4TH JULY, 1950

THE Council having decided to offer a Chesney Gold Medal to Mr. Winston Churchill in recognition of his outstanding contributions to Service literature, and he having expressed his pleasure and readiness to receive the award, arrangements were made for the presentation of the medal on the evening of 4th July, 1950.

A platform was erected at the North end of the Banqueting Hall with the Institution's stand of medals as a background and figures in armour as supporters. The Hall beyond the Waterloo and Trafalgar models was cleared as far as possible in order to accommodate the number of Members which, it was realized, would be far in excess of what the lecture theatre could hold. By 6 p.m. all the available space was occupied by Members who, it was estimated, numbered about six hundred.

Mr. Churchill was received in the entrance hall of the Institution by the Chairman of the Council—Admiral Sir Henry Moore, G.C.B., C.V.O., D.S.O., and the Secretary—Captain E. Altham, C.B., R.N. He was introduced to the officers of the Institution, and then escorted to the Banqueting Hall.

He was greeted with cheers as he walked the length of the Hall to the platform.

The Chairman prefaced his speech by saying that owing to the very large number of Members who naturally wished to welcome the distinguished guest, it had not been possible to do more than provide standing room for the majority. He then made the presentation with the following address.

THE CHAIRMAN

Mr. Churchill, Members of the Royal United Service Institution, this meeting of Members which you, Sir, have honoured by your presence, has been called to enable us to present to you our Chesney Gold Medal in recognition of your outstanding contributions to Service literature.

It may be appropriate if I recall that just ninety years ago this Institution received a Royal Charter which lays down that its purpose is the Promotion and Advancement of the Science and Literature of the Services.

The Chesney Medal was instituted in 1899 as part of a memorial to a distinguished officer of the Royal Engineers—General Sir George Chesney, the virtual founder of

the celebrated Engineering College at Cooper's Hill. Incidentally, I am sure we are all very glad that we have his grand-daughter—Lady Stephenson, with us this afternoon.

From time to time it has been awarded to—I quote the old wording—" the author of an original literary work treating of naval or military science and literature, and which has a bearing on the welfare of the British Empire."

You will be interested to know that the very first recipient of this medal was that great American naval writer Captain A. T. Mahan, who received it for his classic works *The Influence of Sea Power upon History, The Influence of Sea Power upon the French Revolution and Empire,* and his *Life of Nelson.*

I will not select from the list the names of other recipients of the medal, but it includes historians and other writers and editors who have contributed greatly to the store of literature on which officers of His Majesty's Services can draw for their professional enlightenment and education.

I am sure, however, that I am on very firm ground when I say that none of the other recipients have had greater qualifications than you, Sir. Your military works have ranged from the great campaigns of Marlborough to the gigantic operations of the late war in which you were our trusted and triumphant leader. They have become and will remain not only epics of our national achievements but, for the Services themselves, standard works on the statecraft and science of war, while they breathe the very spirit of the British Empire and its welfare.

Having regard to your major preoccupations in the House of Commons we must not detain you here unduly this evening; but I would just invite your attention to your surroundings in this great Hall. Here we have collected trophies of our most notable victories, personal possessions of our greatest warriors, and the likeness of the ships, arms and equipment with which they fought our battles through the centuries—all recalling the valour of our forefathers and the traditions of our race. We therefore thought this the most fitting site in these premises to receive you on this occasion.

These precious records and treasures represent milestones in our military history, and they have a great message for us and for the generations to come; but military history needs masters of the pen to interpret it.

In you, Mr. Churchill, we recognize the pre-eminent master of to-day. Not only have you made history but you have recorded it. So that is why I now, on behalf of the Royal United Service Institution ask you, Sir, to accept our Chesney Medal.

MR. WINSTON CHURCHILL

Admiral Moore, my Lords, Ladies and Gentlemen, I regard it as a very great honour to be invited here to-day and see around me so many faces of so many friends and comrades of our late and former struggles, and to receive at your hands, Admiral, this medal, which I shall greatly treasure and value, and which will be preserved and handed down with my most precious possessions.

I was reading the conditions which were laid down for the award, when it was instituted as a memorial to Sir George Chesney, that the recipient should be the author of an original literary work treating of naval or military science and literature which has a bearing on the welfare of the British Empire. Certainly I have been fully qualified so far as the writing of books about wars is concerned; in fact, already

in 1900, which is a long time ago, I could boast to have written as many books as Moses (*Laughter*), and I have not stopped writing them since, except when momentarily interrupted by war (*Laughter*), in all the intervening period.

It gives me great pleasure to look along the list of those who have received this honour at your hands, and it stirs in my mind many recollections. With regard to your first recipient, Captain Mahan, he certainly qualifies in the highest manner for writing an original literary work treating of naval or military science, but I am not quite so sure that this had a directly favourable bearing upon the welfare of the British Empire (*Laughter*). At that period, when Mahan was writing his memorable books, we had had for seventy or eighty years practically the only important Navy in the World, and for the price of about £10,000,000 a year, or what a modern battleship, if you intended to build any of them, would cost to-day, or what a Brabazon aircraft has already cost, the Admiralty maintained the peace and the freedom of the seas; and our Country never abused its trust or its greatness, though there was no other Navy which could be a serious menace to it. But then there came along Captain Mahan, who pointed out a lot of things to a lot of people (*Laughter*), of which they took a great deal of notice. He dwelt upon the immense advantages which Britain had reaped through sea power, and how our greatness had been founded entirely, or almost entirely, upon it; and this started up a wave of competitive warship building which led on from step to step, with very nice calculations of relative power, and new vessels completely wiping out all the old accumulations of quite valuable ships, until we entered on the more sombre chapters of the history of the XXth Century. Still, there is no more famous writer on naval affairs that I remember.

But I noticed other names that gave me great pleasure. Spenser Wilkinson rendered great services; and Vice-Admiral Richmond I had the pleasure of knowing and working with at many periods of my life. His ability and his contribution to naval and military thought were of the very highest order. I am delighted to see in this list General Sir James Edmonds—"Archimedes" as he was called in the little group of high military officers at the War Office, among whom Sir John French and Sir Henry Wilson were prominent and who thought intently about the conditions under which Great Britain could send an army—an idea which had been discarded for half a century—to fight at the side of France upon the European continent. They all had nick-names, and I well remember "Archimedes." He has been occupied ever since that war—the first World War, which certainly seems to most of us a long time ago, in writing the official history of it in one fine volume after another, all packed with facts and devoid of prejudice of any kind. I understand that he has now finished his labours.

Then there is General Maurice, who played a most important and distinguished part in our affairs, and at one time was held to have stepped somewhat beyond the bounds to which a serving officer should confine himself, but whose acquaintance and friendship I have always enjoyed, and who has rendered such invaluable services for many years to the British Legion.

Then there is General Swinton—I must tell you a story about him. I am so glad that he is the holder of this medal; no one could deserve it more. This was at the beginning of the 1914–18 War, about six weeks after the armies were engaged. In those days the Press were not given any look in at all. They were told "No, it is war; you get out of the way." This position was not maintained indefinitely, and the war correspondent reappeared and has now built himself up a position in all

military operations which, from what one can read in the newspapers, seems to have been in no way diminished or inroaded upon in the latest examples which are before us. But to return to my anecdote. We had a Cabinet close by here, and the question was raised in September '14 of proper representation of the Press, giving the public more information. A very strong discussion took place, and Lord Kitchener, on whose left I sat, was very much for holding the firm position which had been taken and for leaving the public to learn from the published despatches of the Generals, which would reach them in due course and in proper time, what was actually happening at the front (*Laughter*). I did not think that this attitude could be effectively maintained even in those far-off, happy days, and I said to Lord Kitchener " Why don't you have an official correspondent, a friend of the General, living in his entourage, who will give a continuous stream of information to the public, who are naturally rather interested in what is going on (*Laughter*), and at the same time will neither commit indiscretions nor associate the Supreme Command with every word that is written ? " His Lordship looked round and turned to me and said " It is easy to make such suggestions, but whom would you propose ? Give me an example." I said " Why not Major Swinton ? " " Major Swinton ? Who is he ? What has he ever written ? " So I said " Have you read *The Defence of Duffer's Drift ?* " " What!" said Lord Kitchener, " did he write that ? " The subject dropped, but that afternoon Swinton went out to Sir John French's headquarters as an official correspondent (*Applause*).

I am most grateful to you for including me among these distinguished men. We have always to be very careful nowadays—we politicians, if we take an interest in military matters, or are held to have accumulated some knowledge and experience about them, lest we should be described for electioneering purposes as warmongers (*Laughter*). Nevertheless, I cannot possibly escape some association with this military field, and I earnestly hope that all you members of this famous Institution, so many of whom I see gathered in this beautiful hall, will make it your duty to keep alive in the thinking part of the British nation a keen and flexible volume of British thought upon the art of war, without a knowledge of which even now at the present time, after the wars to end wars are over, no nation can be sure that it will survive.

I earnestly hope that the thought of those who are capable of it and are concerned with it will be focused upon the new facts which are every day coming into being. You know the old joke about how the War Office is always preparing for the last war ; and, of course, you cannot help men who have had experience and handled matters, after ten or fifteen years of peace having rooted in their minds the strong impressions which they derived from the actual conduct of operations in the field. That is of the greatest value because, in the main, war consists of the same tunes, played through the ages, though sometimes only on a reed flute or a bagpipe and sometimes through a full modern orchestra. But it is of the utmost consequence that, besides cherishing the fruits of experience, everyone's mind should be open to the ceaseless and almost baffling rapidity of the changes which science is introducing into the whole field of war, into every aspect of it.

Above all, we have this intruder—the air, which has shoved its way in and continues to push forward in all directions, laying its hand now on this and now on that until a lot of people begin to think that it is the only pebble on the beach. That would be going too far : that would be going too far because I am quite sure of this, that when all modern science has been exploited and employed, and when all the worst that can be done has been done in some terrible encounter, which pray God

may never occur, but, if that should be so, still the life of nations will depend upon the spirit, the courage of their race and of their men and women; and the bravery of fighting men, ready to continue whatever happens, will be the final decider of the life of nations, whether in a civilized or a barbaric world.

I thank you so much, Admiral. I remember our work in the War, when you were so great a help. We had those submarines sinking the ships, you remember, and tremendous difficulty in maintaining ourselves and developing our forces. It was natural that the Admiralty should at first measure their success by the reduction of our losses at sea; but presently a place had to be found for another idea, namely getting the largest quantity of cargoes in, or the minimum quota necessary of cargoes into our ports, and so we had to decide to run more risks and lose more ships and get still larger imports of the goods necessary for us and on which we lived. One of the factors was the enormous time wasted in the turn-round of ships. On that I think that the Admiral worked for months, and I watched with the greatest anxiety his weekly results and reports. He was enabled to reduce the days spent in port by nearly one third, or more than one third, and this added to our available shipping a great mass of tonnage which we could never have built in the course of a whole year of the War. We owe him a great debt, and I am delighted to think that he is there at the Nore, watching out upon the Channel, which is, I am glad to say, no longer so dangerous as it was at one time; but I am sure that his Command, although unhappily stripped of the Royal Marines, will not fail to discharge its function, its invaluable function, with the same fidelity and precision which has characterized it so many times in the past.

I thank you very much, Admiral, for presenting me with this medal and for bringing me here and enabling me to see so many of my old friends and comrades. I thank them for their presence here, and I can assure you that I shall carry away sentiments of the utmost gratitude to you for all your kindness, and I shall carry away what will last longer than I shall, this beautiful medal, as a trophy and as a souvenir. (*Prolonged applause.*)

THE CHAIRMAN

I think that before I ask Mr. Churchill to come to the Council Room and sign the Visitors' Book, the Members of the Royal United Service Institution would like to give him a proper send off. I suggest to you that we give him three very hearty cheers. Three cheers for Mr. Churchill! (*Members responded with the utmost cordiality.*)

RECIPIENTS OF THE CHESNEY GOLD MEDAL

(With rank of officers at the time of the award)

1900 Captain A. T. Mahan, United States Navy.
1907 Major-General Sir J. F. Maurice, K.C.B.
1909 Hon. J. W. Fortescue, M.V.O.
1910 Sir J. K. Laughton, Kt., M.A.
1911 Professor C. W. C. Oman, M.A., F.S.A.
1913 Colonel Sir L. A. Hale.
1914 Sir Julian S. Corbett, LL.M., F.S.A.
1919 Major-General E. D. Swinton, C.B., D.S.O.
1921 Major-General Sir C. E. Callwell, K.C.B.
1924 Professor G. A. R. Callender, M.A., F.S.A.
1925 Captain Sir George Arthur, Bt., M.V.O.
1926 Vice-Admiral Sir H. W. Richmond, K.C.B.
1927 Brigadier-General Sir J. E. Edmonds, C.B., C.M.G.
1928 L. G. Carr-Laughton.
1929 Colonel H. C. Wylly, C.B.
1930 Dr. D. E. W. Bean.
1931 Commander C. N. Robinson, R.N.
1932 Colonel C. de W. Crookshank, M.P.
1936 Professor Spenser Wilkinson.
1950 The Rt. Hon. Winston S. Churchill, O.M., C.H., M.P.

THE MEDAL

The Chesney Gold Medal is portrayed in the frontispiece of this journal. It is a gold circular medal, two inches in diameter, designed for the Institution by Mr. Allan Wyon in 1898. The obverse carries a head of Britiannia with a trident, while the reverse bears the words " In Memoriam General Sir George Chesney, K.C.B., R.E." enclosed in a wreath of laurels with the words " Awarded by the Royal United Service Institution " surrounding the wreath.

THE TECHNICAL TRAINING OF THE NAVAL OFFICER OF TO-DAY

By VICE-ADMIRAL (E) SIR DENYS FORD, K.C.B., C.B.E.

ADMIRAL SIR ROBERT L. BURNETT, G.C.B., K.B.E., D.S.O., in the Chair

On Wednesday, 22nd February, 1950, at 3 p.m.

THE CHAIRMAN : I am here to-day for two reasons. The first is, of course, to preside and introduce your Lecturer ; the second is that, when the lecture is over, I shall be able to take my coat off and get into the arena when the scrapping starts, and see that there is no biting or hitting below the belt.

I have been asked to do this because at the moment I hold the dignified position of Chancellor of the Engineering University of the Royal Navy ; also I have in my command the College at Dartmouth where most naval officers start ; the Stokers' Training Establishment ; the Leading Stokers' Training Establishment ; the Artificers' Training Establishment ; and, last but not least, the Officers' Engineering College. I am not Warwick the King-maker but Burnett the Chief-maker : those who have served with me, if they are worthy of it, rise to the dizzy heights of Engineer-in-Chief of the Fleet. There are three of them already, and next week there will be four ; a little later, after I have retired, I hope there will be at least a fifth that I have seen elevated to this high position.

Now, I have very much pleasure in introducing my old and valued friend, Sir Denys Ford.

LECTURE

DURING the last half century the opinion of the Navy regarding the technical training of officers has veered from one idea to another. Probably no subject has led to greater controversy, and even to-day nearly every naval officer has unshakable opinions on this subject.

I propose to divide this lecture into four parts :—

(1) A very short historical survey of the history of technical education since 1902.

(2) A brief discussion on the technical requirements to be met by naval officers.

(3) A description of how the training of technical officers is now carried out to meet those requirements.

(4) A review to bring into sharp relief the position at which we have arrived to-day.

Before embarking on this lecture it must be made quite clear that I have no wish to re-open old wounds which are best forgotten, but to indicate that this subject has a great bearing on the structure of the Navy and that, although different opinions can be sincerely held by individual officers, yet a solution which was universally accepted obviously would be highly desirable.

HISTORY OF TECHNICAL TRAINING IN THE NAVY

H.M.S. " Excellent " was established in the 1870's as a Gunnery Training School, and H.M.S. " Vernon "—an offshoot of H.M.S. " Excellent," as the Torpedo Training School in the 1880's. H.M.S. " Marlborough," at Portsmouth, was first allocated as a training ship for Engineering students in 1877, and in 1880 a Training School for Engineering students was instituted at Keyham College. In 1888, the " Marlborough " was paid off.

The Selborne-Fisher scheme was announced on Christmas Day, 1902. Under this scheme the officers required for the Executive, Engineering and Marine Branches of the Navy—in short those officers essential for the fighting efficiency of a ship—were to be given a common entry and common training until such time as they would specialize in their respective Branches. The reasons given for the introduction of the scheme can be summarized as follows :—

(*a*) to ensure co-ordination between the Executive and Engineering Branches of the Navy ;

(*b*) to man those branches by officers drawn from the same source ;

(*c*) to give all officers equal opportunity and equal status ;

(*d*) to ensure that whilst specialist officers had a full knowledge of their own speciality, yet they would have a general knowledge of the duties and capabilities of other branches.

The first term of Cadets, aged 12 to 13 years, who had been selected for entry under the scheme, joined the R.N. College, Osborne, in 1903. The housing of this new establishment in the Royal Estate at Osborne had been made possible by the generosity of H.M. King Edward VII. The curriculum of education as laid down consisted of :—

(1) Four years training ashore—two years at the R.N. College, Osborne, followed by two years at the R.N. College, Dartmouth.

(2) Two terms in a cadet training cruiser.

(3) Three years as Midshipman.

(4) Examination for Lieutenant to be passed from sea.

(5) All Sub-Lieutenants to obtain Upper-Deck Watchkeeping and Engine-room Watchkeeping certificates.

(6) Seniority as Lieutenants to be adjusted in accordance with time gained at the various examinations.

(7) Specialization at approximately two years seniority as Lieutenants.

(8) The education to be mainly scientific.

(9) One-third of the training as Cadets, Midshipmen, and Sub-Lieutenants to be spent on engineering subjects or in the engine-rooms of the Fleet.

In 1905 a Committee under the presidency of Admiral Sir Archibald Douglas was ordered to report :—

(*a*) whether any necessity exists for distinct classification of such officers who are entered under the Selborne-Fisher scheme ;

(*b*) whether specialization for a period of their career only is necessary;

(*c*) how best to provide for the efficient filling of higher scientific appointments open to Engineer officers.

The Committee reported that as regards (*a*) and (*b*), there was no need for a final division into three Branches and that specialization for a period only is necessary, as opposed to permanent classification into separate lists. The Admiralty commented: "There can be no question of the great advantage to the efficiency of the Service that this removal of difference will entail."

Although many details of the training of the officers entered under the Selborne-Fisher scheme were constantly being altered, the fundamental basis of the scheme remained unchanged. These principles were :—

(*a*) a common entry ;

(*b*) common training and appointments until specialization occurred in Gunnery, Torpedoes, Navigation, Engineering, etc. ;

(*c*) all specialists to be on an equal footing ;

(*d*) specialist officers to revert to general service on being promoted to the rank of Commander except in the case of a few officers (not exceeding 10 per cent. of the total number of Engineer officers) who would volunteer to devote themselves for the remainder of their Service career to Engineering, thus fitting themselves for the higher Admiralty and Dockyard posts and being compensated for the loss of command by increased pay and prospects.

The first term of the Selborne-Fisher entry were promoted to Sub-Lieutenants in 1911.

In a statement of Admiralty Policy made to Parliament in 1912, Mr. Winston Churchill said that officers who volunteered for Engineering would remain members of the Military Branch, being placed on an equal footing in all respects with officers who volunteered for Navigation.

The first specialist course for (E) officers, who by this time were Lieutenants, commenced in 1913. The course consisted of two terms at the R.N. College, Greenwich, followed by one year at the R.N. Engineering College, Keyham. After the first two courses recruiting for (E) officers virtually stopped owing to the 1914–18 War, and the need for Executive officers.

In 1918, entry to the Engineering Branch was examined by a Committee consisting of Mr. McKenna, Admiral Lord Jellicoe and Sir George Goodwin.

When introducing the 1920–21 Estimates, the First Lord stated that it was considered that final separation between the officers of the Executive and Engineering Branches was essential. He said : " There is a definite distinction, both as regards knowledge and capabilities, between those who are trained in the science of naval war, and strategical and tactical method of fighting, and those who are to deal with the upkeep and maintenance of engineering and mechanical appliances which are necessitated by the complex machinery and weapons of war." He emphasized the absolute necessity for full co-operation and sympathy between the officers of the two branches, and stated that it was believed that this condition could be obtained by common entry and training in the initial stages of an officer's career. In order that a due proportion of officers of ability should be attracted to the Engineering Branch the following decisions had been made and promulgated :—

(*a*) the duties of the Engineer-in-Chief were to be extended and he would, in future, be held responsible for advice on all matters in connection with Engineering policy and the instruction and training of the personnel of the Engineering branch ;

(*b*) when (E) officers became available, they were to be considered with Deck officers for appointment as Admirals Superintendent of Dockyards.

It was also stated that in future no (E) officer would have the right to revert to the Upper Deck, and that it was intended to set up a Committee to consider the question of transferring the responsibility for the upkeep and maintenance of the

electrical machinery from the (T) officer to the (E) officer; thus, apart from other considerations, opening up further positions to officers who elected to specialize in Engineering.

When introducing the 1921–22 Estimates the First Lord said that the policy incorporated in 1920 had been further developed, and to this end the following decisions had been made :—

(1) to transfer the electrical installation of ships from the Torpedo Branch to the Engineer Branch ;[1]

(2) that in future officers who volunteered to specialize in Engineering would do so earlier than had previously been the case, and that they would specialize on being rated Midshipmen. It was considered that the period of common training at Dartmouth and as Cadets at sea was sufficient to give common understanding of the ideals and discipline of the Service. The Committee forecast in the 1920–21 Estimates reported during this year; they had made recommendations that the pay and prospects of (E) officers should be improved so that sufficient candidates of the right type would be attracted to this Branch of the Service.

Final segregation of the Executive and Engineering Branches was completed in 1926. In 1937, the Admiralty became responsible for the Fleet Air Arm, and (E) officers were selected for flying training as pilots in 1938.

The Committee, presided over by Vice-Admiral Sir Sidney Bailey, on maintenance of gunnery equipment reported in 1939 and it was decided that officers of the (E) Branch could specialize in Gunnery Engineering.

In 1945 the Electrical Branch was introduced.

TECHNICAL REQUIREMENTS FOR NAVAL OFFICERS

From the brief historical survey which has just been given it will be realized that the Navy of to-day is divided into User and Maintainer. The User is given practically no technological training and expects his weapons to be maintained and repaired for him by the Maintainer, who is an officer in the Naval Technical Branches —the Engineering Branch and the Electrical Branch.

Weapons and machinery are designed under the umbrella of these Technical Branches or by the Admiralty Civilian Departments and Ministry of Supply. The Engineering Branch is responsible for Marine, Air and Ordnance Engineering, and the Electrical Branch for all forms of Electrical Engineering, including Radar and Radio.

The naval organization of to-day, therefore, has departed completely from the ideals of the Fisher-Selborne scheme of training. Indeed, the logical outcome of the Fisher-Selborne scheme can best be seen in the structure of the U.S. Navy, since, as is so often the case, an invention made over here has been exported over the Atlantic and brought to its full development in the United States.

This division between the User and Maintainer marks a break in tradition which had lasted in the Navy since the days of sail and means that the Service is rapidly reverting to the pre-Commonwealth system when the ships' companies were divided into soldiers and seamen—the first to fight, the second to work the ships.

[1] After further consideration, only the electrical machinery situated in the Engine-Room Department of H.M. Ships was transferred to the Engineering Branch. The remainder of the electrical machinery and installations remained as hitherto in the charge of the Torpedo Officer.

Naval equipment consists of machinery and weapons of the highest quality of design. Commercial counterparts, where such exist, have to be lightened and stressed to the limit if they are to be installed in a warship. Nearly all new inventions of a mechanical or electrical type find a home in our ships, and it is not an exaggeration to say that many inventions on which our civilization rests have been assisted in development with money obtained from Naval Votes. Many examples can be quoted, but it is sufficient to mention wireless and radar, the water-tube boiler, steam turbines, and to-day the gas turbine and the modern light-weight Diesel engines.

At this point it may be as well to define the difference between the terms " technical " and " technological." As I see it, a technician is one proficient in the actual arts and craft. Technology is an understanding or knowledge of all the sciences and processes without necessarily the manual dexterity. For many years, therefore, the Navy has had to develop technologists who can hold their own not only with the highest technical thought in the Country but who, in addition, can lead industry by administering the Naval Estimate Votes for the improvement in naval material and in the development of new inventions. These technologists have a very close connection with Industry on the one hand and with the Research Associations on the other, particularly in the shipbuilding, engineering and electrical industries, and it is hoped that in future they will also strengthen the contacts with the aeronautical field.

Again, naval technological officers are responsible for the repair and maintenance of the material of the Fleet and for many parts of the logistic support of the Fleet. Furthermore, they and their ratings operate and maintain the machinery and equipment afloat.

We have, therefore, three groups by no means necessarily segregated for which training must be devised. Indeed, the best officers must have experience in all three groups if they are to succeed in the highest ranks to which they can attain.

Abandonment of the Selborne–Fisher Scheme

Before passing to the technical training of these officers, it is worth pondering on what the Navy has gained and lost by throwing over the Selborne-Fisher conception.

The gains can be summarized as follows :—

(*a*) The technical officer can be trained with a narrower objective than that which would be possible if the highest Commands afloat were open to him.

(*b*) The appointments which he holds throughout his Service life can be made more selectively, so that the best officers can be given the experience necessary for them to hold their own with the highest technical thought in the Country.

(*c*) All technical officers become indoctrinated with the normal approach to scientific fact. This approach is both a strength and a weakness to the officer : a strength because he is taught to recognize facts and knows that two and two make four ; a weakness in that often he cannot see the wood for the trees. It is seen at its best in the U.S. naval conception of war as an engineering project ; at its worst in its failure to risk material damage even to the point where it hampers operations in war.

The losses are more intangible, but they include :—

(1) The danger of the Executive officer getting out of touch with his material and treating it with scant sympathy.

(2) The tendency of the modern ship's company to be divided into Users and Maintainers. This causes some increases in complement, but above all breaks down the tradition that the Executive officer knows the best workmen in the ship. Many of those ratings now work almost entirely under their technical officers and look to them for advancement.

(3) The fact that many demands of staff requirements are met—but at a price. It is always difficult to get a technician to say he cannot meet a demand, but having met it, the design of a ship may be unbalanced.

These brief remarks are only the fringe of a very big subject. They are made purely as an introduction to the principles which must underlie the training given to naval technical officers.

TECHNICAL TRAINING OF NAVAL EXECUTIVE OFFICERS

In my historical survey it was shown that, since 1924, successive steps have been taken to increase or widen the knowledge of the Executive officer in the humanistic studies at the expense of scientific studies, and particularly of mechanical science. In effect the Executive officer, whether he specializes or not, is given sufficient functional training in his Sub-Lieutenant and Specialist courses to fit him to be a user officer. Many Executive officers who have scientific bents will teach themselves and absorb the sciences on which the material for which they are responsible is designed and maintained, but broadly speaking the Executive officer of to-day has had his instruction in scientific subjects reduced to a minimum.

Thus, whilst those Cadets entered at the age of 13 to the R.N. College, Dartmouth, were at least brought up to and beyond the School Certificate standard in mathematics and science, the Cadet of to-day at 16 and the Special Entry at 18 can be entered into the Service from the classical side of his school without any knowledge of scientific subjects whatsoever; thereafter, if he be a Special Entry Cadet, his total instruction in mechanical science or engineering is limited to one week in his first term, two weeks in the training cruiser, and one month during his Midshipman's time. During the two terms spent by all Sub-Lieutenants at the R.N. College, Greenwich, a little more than one-third of his time (i.e., about nine weeks in all) is spent on mathematics, applied mechanics, physics, electrical engineering, chemistry and metallurgy, with the intention that they should absorb a very general "child's guide" background in electricity, electronics, metals and material, corrosion, combustion, fuels, aerodynamics, etc. Subsequently, unless he specializes in Gunnery, Torpedo, Anti-Submarine, Signals, etc., where, apart from the advanced courses, the ordinary Long Courses include a certain amount of basic science appropriate to the particular Specialist Branch, he may not touch the scientific knowledge on which the material of the Fleet has been designed, during the remainder of his career, except in so far as these subjects are introduced and referred to in lectures at Staff, War and Technical Courses.

In making these statements it must be clearly understood that a division has been made between the mechanical and electrical sciences on which the material is developed, manufactured, maintained and repaired and the sciences necessary for the use of the material. Thus the Gunnery Officer of to-day will be given a thorough

knowledge of ballistics and kindred subjects and the Signal Officer of frequencies and power output for the radio communications. In some cases the bare minimum scientific knowledge is common to both the Executive and Technically trained officer, but this is not always true, since the duties of User and Maintainer do not invariably overlap each other.

TECHNICAL TRAINING OF NAVAL TECHNICAL OFFICERS

In the Navy of to-day there are two Technical Branches :—

(*a*) *The Engineering Branch*, which covers Mechanical Engineering and, by sub-specialization, Marine, Air and Ordnance Engineering.

(*b*) *The Electrical Branch*, which covers High and Low Power Electricity, and Radio and Radar Engineering.

Engineering Branch

The requirements of the training given to officers who join the Engineering Branch are :—

(1) They should first be Naval officers with all that this implies.

(2) Cadet entries should reach the standard of Chartered Mechanical Engineers, i.e., be qualified to become corporate members of the Institution of Mechanical Engineers.

(3) They should make a special study of either Marine, Air or Ordnance Engineering.

Cadets (E) are entered under the same common entry conditions as Cadets of the Executive Branch, whilst Cadets, either of the 16-year-old entry or Special Entry, receive identical training to their brother Cadets.

As Midshipmen (E) they go to sea for eight months with the object of being indoctrinated with naval tradition, customs and routine, and to make themselves acquainted with the material and equipment to which subsequently they will have to devote their lives. Particular emphasis is laid on working with ratings. In addition to the practical training given to these young officers by definite periods in the various departments of their ships, they are given some hundred hours of instruction during their eight months training in mathematics and science with the intention that they should be brought up to approximately an Inter B.Sc. standard by the time they complete their training, before entry to the R.N. Engineering College. Since most of these young officers do not leave their public schools until they are 18, such a standard is by no means impossible to obtain and it is comparable with the standard expected by the Universities for entrance.

After eight months training afloat as Midshipmen (E), the young officers, now aged approximately 19½, are appointed to the R.N. Engineering College, Devonport, for a two-year course which has been conceived on University lines. Instruction is given by lectures and the tutorial system, and the officers under instruction are expected to teach themselves rather than have knowledge pumped into them. The main object of the course is to provide instruction in those principles of science which are the essential foundation to the profession of Engineering however the student may specialize later. It is intended to give a broad, rather than a specialized course of training in science and applied mathematics which will enable the student to attack unaided the problems he will encounter later as a professional naval officer.

The training at the R.N. Engineering College also aims to strengthen the moral fibre and the officer-like qualities of future Engineer Officers. Officer-like qualities, in this context, may be summarized as knowledge, will-power, integrity, faith, courage, initiative and flair. The favourite training mediums at the R.N.E.C. are football (rugger); sailing—including ocean racing; rock climbing; flying Tiger Moth aircraft; also the usual intellectual and cultural activities such as literature, music, debating, choral work, acting, etc. These mediums, it must be stressed, are used as means to an end and not an end in themselves.

At this point perhaps I may be allowed to make a slight digression. The structure of any naval officer branch is conditioned very largely by the system of promotion and retirement—often at a comparatively young age. In the Navy only a minority of officers can reach high rank, and this fact in itself entails limitations which are not so apparent in the industrial world. Indeed, even if it were possible to recruit only first-class brains, it would be inexpedient to do so since the Service cannot offer openings and promotion for everybody. This leads me to the next question of importance, that of minimum acceptable standards.

Technical officers command not only by having personality and individuality, but in addition they must have more technical knowledge than their men if they are to hold the latter's respect. The minimum acceptable standard now used for the Cadet officer is that necessary and laid down for Corporate Membership of the Institution of Mechanical Engineers. An officer who cannot attain such a standard at the end of his two-year basic course at the R.N. Engineering College has to be withdrawn from the Service.

As a relief from the purely academic studies at the R.N. Engineering College, the officer under instruction spends about 30 per cent. of his total instructional hours in the workshops and in production. This part of the course is entirely modern in conception, and is based not so much on the idea that the student should gain skill of hand, but that he should be able to understand the broad principles underlying Mass production and repair, Batch production and repair, and Individual production and repair, with the aim that in later life he will be able to administer and hold his own with production, maintenance and repair problems. At the same time, although the officer is not trained as a craftsman, he must know sufficient of the craftsman's work and training to be able to criticize constructively the craftsman's work whether from the standpoint of naval or civilian labour and industry.

On joining the R.N. Engineering College the officers are examined and divided into A and B classes. The syllabus for both classes is the same, but the A class will go more deeply into their subjects than the B class.

On completion of the two-year basic course the officers, now of Sub-Lieutenant rank, are appointed to sea to gain their certificate of competency and experience as a watch-keeping officer in the operation of machinery.

At the end of one year (six months in the case of officers selected for training in air engineering and training as pilots) the officers are re-appointed to the R.N. Engineering College for their specialist courses. By this time the group has been divided into three groups:—

40 per cent. for Marine Engineering;
35 per cent. for Air Engineering;
25 per cent. for Weapon Engineering.

The Specialist courses vary slightly from group to group and take approximately one year. Their object is to direct the officer's basic engineering knowledge towards the particular naval specialization—Marine, Air or Weapon Engineering, which he will pursue, and to broaden his knowledge of the theoretical and practical aspects of that branch.

The special courses required for the specialization cover in each subject :—

(*a*) Theoretical engineering.

(*b*) Design and lay-out of machinery and equipment.

(*c*) Running of selected machinery, testing the equipment and analyzing the result in order to obtain a knowledge of instrumentation and interpretation of physical phenomena.

(*d*) Repair of the equipment.

On completing his course, the officer is considered to be fully trained and is appointed to sea or elsewhere in complement billets.

Further Instruction

Only a minority of the officers who are specially selected and who are in every way suitable for higher training are given post-graduate courses. These consist of :—

(*a*) Advanced courses in Marine and Ordnance Engineering at the R.N. College, Greenwich, and in Air Engineering at the Aeronautical College, Cranfield. The courses are specially designed to enable the officer to obtain sufficient knowledge to enable him to be appointed to the design sections at the Admiralty and in H.M. Dockyards, Aircraft Repair Yards, Ministry of Supply and to the specialist firms employed on Research and Development.

(*b*) Flying courses. A proportion of officers who specialize in Air Engineering are selected for training as pilots to fill the positions of test pilots and to gain experience of the Naval Aircraft Pilot's problems. It is the intention when this section of the Engineering Branch is built up, that normally the Air Engineer Officer of a Naval Air Station should have a (P) qualification in addition to that of Air Engineering.

Acquaintance or Refresher Courses

Engineering to-day covers such a wide range that it is impossible for any single officer to know all the details of all the machinery with which he may come in contact during his career. Acquaintance courses are, therefore, being introduced slowly. In effect, each course is individualistic to the officer concerned, and is taken when he knows his next appointment, and is intended to cover the gaps in his knowledge required for the particular job. The course may last for a few days or a week or two, dependent on the officer concerned and the newness of his job compared with his previous experience. It may be in an Admiralty Department, at one of the Research and Development establishments or at the R.N. Engineering College or at the works of a firm. These courses are in effect post-graduate courses for an immediate and specific job of work.

Administration Course

Since the War, an Administration Course lasting six weeks has been started at the R.N. Engineering College in order that Engineer Officers of Lieutenant or Lieutenant-Commander rank may be able to get a grasp of the many technical organizations with which they must deal on promotion to Commander (E).

In the foregoing short statement I hope it has been shown how the Technical Officer is trained in order that his knowledge may be brought to bear on the design, manufacture, repair and operation in such diverse and complicated highly stressed machinery as guided missiles and aircraft, marine propelling machinery suitable for novel fuels and of special cycles, steam, Diesels and gas turbines, fully automatic weapons and their associated fire control.

In the majority of cases these officers have to work in close contact with scientists, engineers of all types and research associations. The training which is now being given is intended to enable them to hold their own in these very wide fields.

Electrical Branch

Naval Electrical officers under training fall into five categories :—

(1) Cadet Entry officers—age limit on entry, 17 to 19.

(2) University Entry officers—age limit on entry, 21 to 25.

(3) Ex-Apprentice Cadet Entry officers.

(4) Officers direct-promoted from the Branch List—age limit on entry, 25 to 36.

(5) Upper Yardmen Entry officers.

Cadet Entry officers enter the Service in September, between the ages of 17 and 19, with academic qualifications equivalent to Higher School Certificate, with principal subjects mathematics and physics. Immediately after entry they take the Qualifying Examination for the Mechanical Sciences Tripos at Cambridge. After a period of non-technical training at Dartmouth (one term) and in the training cruiser (two terms), the officers proceed to the Naval Electrical School—H.M.S. "Collingwood," where they are given a course of basic workshop training. During this period they spend one month in the Electrical Engineer Manager's Apprentices' training shops in Portsmouth Dockyard.

In October (approximately one year after entry) the officers go to a University (usually Cambridge) for three years, where they read Electrical Engineering up to Honours Degree standard. During the University vacations they are sent to firms of electrical engineers and manufacturers, for works experience in heavy electrical engineering, battery and cable manufacture.

After completing the University course, short periods of practical training are spent with light electrical engineering firms and in the General Post Office. The officers then return to the Naval Electrical School for instruction in high power and damage control.

A period of six months training at sea follows. This training is not purely technical, being designed to give general experience of ships at sea.

After this they return to the Naval Electrical School where they undergo eighteen months training in radio, radar and low power. This period includes six months industrial training with radio firms and two months at the Naval Air Electrical School—H.M.S. "Ariel."

This completes the training of these officers, who are then sent to complement billets (approximately six years after date of entry).

SUMMARY

So far, I have omitted the various methods of entry to the Engineering and Electrical Branches; but they can be summed up as:—

(1) By the Dartmouth entry at 16 years of age.

(2) By Special Entry at 18–19 years of age.

(3) By a limited number of Cadetships ex-Artificer Apprenticeship.

(4) By direct entry from the Universities.

(5) By selection from Upper Yardmen ex-ratings.

(6) By direct promotion to Commissioned Rank from the Branch List.

85 per cent. of the number of officers entered into these two Branches are under (1), (2), (3), (4) and 15 per cent. by (5) and (6).

The objectives in the training of Naval Engineer Officers are that they should have the following qualities on completion of their training:—

(*a*) The standard of leadership, self-reliance and integrity traditionally required of all naval officers.

(*b*) Some knowledge of the work and duties of all branches of the Navy, and personal experience with the officers and ratings concerned, particularly in the case of their own Branch.

(*c*) A thorough grounding in the basic mechanical sciences and the practice and ability to work individually, using their brains and reasoning power in applying the scientific principles they have learned to practical problems.

(*d*) The grounding with practical experience in the basic crafts on which the production and repair of all mechanical equipment depends.

(*e*) A good measure of applied technological training in one of the three main sub-specializations to which they will be appointed on completion of their training.

Briefly, the problem is to achieve these objectives in the minimum non-effective time, as economically as possible, with a fairly wide range of ability both intellectual and in officer-like qualities on entry.

CONCLUSIONS

I hope that, by now, I have made it clear that the Navy has progressed a long way down the road where the User and Maintainer have parted company from each other. On one hand the User has no technical training in the sense that this term is accepted in the educational organization of the Country; on the other, the Technologist is often the designer as well as the repairer and maintainer. The Navy, as regards both its personnel and material, is tending to become more and more technical. I ask you, therefore, to consider whether it has taken the right road for continued efficiency and success. That is really the debatable part of this lecture.

At the beginning of the Century, the Navy believed in the Nelson tradition that the naval officer should be not only a master of naval warfare but a seaman—a term which implied having the technical knowledge of everything appertaining to naval warfare.

At the end of the 1914–18 War a break with this tradition began which ended with the introduction of the Electrical Branch at the end of the late war, and which

now postulates the theory that naval warfare in itself is so complex that those officers who study this art neither have the time nor need to acquire the scientific knowledge necessary to engage actively in the development, design, maintenance and repair of our ships and the equipment which is fitted.

In order to obtain the necessary scientific knowledge to enable an effective contribution to be made in the development and design, an education up to University Standard in mechanical and allied sciences is required, together with post-graduate training, and such an education cannot be obtained in a shorter period than four to five years.

After the 1914–18 War there was, I think, an impression in the Navy that its higher direction had been based unduly on consideration of material which in its turn had reacted unfavourably on its tactical use. At this period it appears that, having abandoned the Selborne-Fisher scheme nothing was instituted in its place, with the result that to-day the technical branches have filled the vacuum and have now become responsible for all naval material in many fields.

However much we may deplore the fact that the Executive officer has lost intimate knowledge of his material, it must be emphasized that material of all types has become so complex that no superficial, dare I say "school-boy" knowledge is sufficient to enable an officer to develop, design and maintain it efficiently. Thus the answer does not lie with increasing still further the over-burdened syllabi of Dartmouth, Training Cruisers and Sub-Lieutenant's Courses.

Further, although the 16-year-old entry and Special Entry from the classical sides of our Public Schools may limit still more the technical appreciation of our Executive officers, yet reversion to the 13-year-old entry would not in itself cure the disease. If indeed the Executive officer is to exercise his age-long right of being considered to be a master of his trade, it is necessary that he should be given a full University course in the sciences, together with some post-graduate training, as indeed is the system of education employed in the U.S. Navy.

The system of naval education to-day has many dangers, of which probably the greatest is that the Executive officers will get further and further out of touch with a large proportion of the ships' companies owing to the fact that their duties do not require them to work with ratings from hour to hour and day to day in the way that technical officers of the Fleet must employ their time if the machinery for which they are responsible is to work when required. On the other hand, the American officer manning structure tends to make the officer more concerned with material questions than he is with the higher direction of war.

Departure from tradition in the internal organization of discipline and the general welfare of our ships' companies caused by this division of User and Maintainer, is increasingly apparent, apart from the fact that naval efficiency to-day depends on the integration between the Services and the Industrial and Educational life of the Nation. To a large extent such an integration, where it exists, has passed into the hands of the Technical Branches, and it is difficult for such officers to impress their brother officers in the Executive Branch with the factors on which sea power must rest apart from tactical uses of naval forces at sea.

My own personal view is that the time has arrived when it should be considered dispassionately whether or not it is possible to obtain the best—and I repeat the word "best," since we require the very best—from both the British and American systems of naval education and the structure of the officer branches of the Navy.

It is impossible to forecast what such an investigation would produce; but if it were found that salvation lies in reverting to the principles underlying the Selborne-Fisher scheme then the solution may be :—

(1) To abolish the Sub-Lieutenant Courses and substitute a University course of about 2½ years duration with the basis of obtaining a B.Sc. degree;

(2) To employ the young officer thereafter in technical specializations; and

(3) To select those officers who indicate that they are suitable in all respects for Command at sea and special staff appointments before they reach the rank of Lieutenant-Commander, and give them post-graduate training specially devised to this end.

Obviously such a solution would require the best brains of the Navy to devise the new administrative machinery for its smooth working, particularly during the transition period, and above all the determination of successive Boards of Admiralty not to be deflected again from a fundamental policy.

DISCUSSION

THE CHAIRMAN: That concludes the lecture, and very interesting it was. Now I will ask Captain Altham to be so kind as to open the Discussion and give you a start.

CAPTAIN E. ALTHAM, R.N.: It is my privilege to start the train of what I hope will be a really lively discussion. I want to preface my remarks by saying that I hope you all realize what a particularly appropriate forum we have here to discuss such matters as these without fear or favour.

This is a subject vital to my old Service, but I hope this lecture may be followed in due course by something similar relating to the other two Services who, I know, have their own problems and interests in the technical training of officers.

Many of us can recall the old Gunner's Mate who used to begin his instruction to a new class by saying "Now, before we starts the drill, it's necessary that we should know something about the weapon we're going to use." That admirable maxim, judging by the lecture which we have just heard, appears to be in danger to-day of being forgotten. The Engineer-in-Chief has left me with the impression that the Executive officers of the Navy are now being given little training in the working and maintenance of the weapons which they have to use, and that Gunnery and Torpedo Officers are no longer completely responsible for the good order and efficiency of the machinery and equipment of their departments in the way they used to be, nor, it would seem, are the Officers of Quarters responsible for their quarters.

Now, this is not, it seems to me, just a matter of convenience in training, administration or organization. It is one which, I think, must eventually affect the whole conduct of naval warfare. Those of us who have been both users and maintainers can recall the days when, although the Navy was well advanced in the era of mechanization, the greater number of our senior officers—because they had not had proper technical training—were profoundly ignorant of their weapons and how to make the best use of them. For example, the close association between tactics, fire control, concentration of fire and rate of fire was so much jargon to them.

Gradually we emerged from those dark days as a new and better-trained generation of naval officers climbed the ladder of promotion. I wonder whether those Flag Officers who were such great and successful commanders in the late war—I speak with all deference in the presence of our Chairman to-day—realize how much they owed to their early training under the Selborne-Fisher scheme and to the technical knowledge which they imbibed throughout their service under the system whereby users had a large share of responsibility for what might be termed upkeep?

By depriving the Executive officer of technical training and responsibilities, it seems to me that we are tending to revert to those bad old days when officers in high command, because they knew so little about the potentialities and limitations of their weapons, could not make the best use in action of the ships that carried them. This had other ill effects in the past, in the shape of the bad designs of ships; and if we revert to a similar system it must be detrimental to the rebuilding of the new Navy in years to come.

At the moment we have at the Admiralty and at sea Flag Officers who have the technical knowledge and experience which enables them to talk the same language as the specialist officers, the designers, constructors, and even the scientists, so that invention, design and utility can go hand in hand; but if the user officer is not to know more about the working of his ship and of its intricate mechanism than which button to press, how is he going to play his part in evolving new requirements which will stand the test of battle? Or where, we may well ask, are we going to find our future D.N.O.s and D.U.W.s, and even Controllers of the Navy?

The Lecturer has also pointed out how the present system of naval education and training is widening the gap between the Executive officer and an increasingly large proportion of the ships' companies. It would seem that the technical ratings must be coming to regard what used to be called the 'deck officers' as those with whom they only come into contact when they are defaulters, and as having little knowledge of their special duties or outlook. Surely that cannot make for the best form of discipline? In short, are we not producing a brand of user officers who will be like the man who can drive a car, but who does not know or care what is under the bonnet, and who must always have a skilled mechanic with him or else turn into the nearest garage, because he does not know why it goes or why it stops, much less how to get the best out of it?

I suggest that it is not necessary—and here I differ from the Lecturer—that all officers who are to make an effective contribution to the development of design should have an education up to university standards in mechanical and allied sciences, lasting four or five years. That is too big an interval, I think, to take out of the Executive officer's sea-going career. I should like to interject here that I emphatically disagree with the opinion—not that the Lecturer suggested that it was *his* opinion, but he intimated that it was *an* opinion held after the 1914-18 War—that during that war the Navy suffered from overmuch consideration of material, to the detriment of sound tactics. If the "Up boys and at 'em" school who propounded that view had possessed a better knowledge of their ships and weapons and of the need for training in their use, they would, judging by all historical and technical records, have achieved better results in action.

The Executive officer does not need to be a highly-trained engineer, a skilled craftsman or a scientist, but, if he is to be something better than a button-pusher, he must have that technical grounding which will enable him to understand what makes the wheels go round, and be able to say, from the point of view of the user, how they could be improved. The existing system tending towards complete segregation of the user from the maintainer would appear to be against all the lessons of two great wars; it is diametrically opposed to the practice in the American Navy, and is bound to be detrimental to the efficiency both of personnel and of material in our own Navy.

Finally, I would most cordially subscribe to the view, which I gather the Lecturer holds, that now is the time to reconsider the whole question of naval education in the light of those lessons and of our future requirements.

MR. B. W. PENDRED (Editor of *The Engineer*): I am a visitor. I have no experience of the Navy, practically no military experience, have never done any teaching, and have had no more experience of being taught than anybody else, so that in any remarks that I make I am purely doing what the onlooker does. But I do not claim, as so many onlookers do, to see most of the game.

I know a certain amount about education for industry, and I think that anybody who is concerned with education for industry will be highly envious of the kind of

conditions that rule in Naval Colleges. You have considerable advantages, which flow from the fact that one large organization is training its own personnel for its own large, but still limited, purposes. You have, further, the advantage that it seems to be quite easy for you to adopt the " sandwich " type of educational course. I think that generally in industry it is admitted that that course is the best, but it is not an easy one to arrange. Another advantage which you have in this " sandwich " course is that on the practical side of it you can be bold enough to give your young men quite considerable responsibility at a very young age ; and I think that most people, even in industry, will agree that that is very important, but would often say " We just cannot afford to do it, in case they break something."

Another thing that struck me in listening to this paper is that industry is only now considering post-graduate technological courses, and wondering whether it is going to adopt them, while the Navy already has them, and presumably is finding them of great advantage. I think that the Navy may be before industry in adopting such courses because it is easier for the Navy to send its men back to school than it is for industry to do so.

A thing which every educationist will envy is the fact that your students are part of the Naval Service. The consequence is that you have control of them during leisure hours. You can therefore direct their interests and sports and reading so as to develop those characteristics, difficult to describe, which we call initiative, drive, will-power, character, etc. It is a frequent criticism of the product of the ordinary shore college that the students lack those qualities and have to develop them in the works at a later age.

Now we come to the controversial part. It is not for me to put forward any suggestions about that, but, as a layman, I did feel quite alarmed, when I heard this Lecture, to learn that there is this growing division between the technical and executive sides of the Navy. I think that most laymen know generally the principles that Nelson laid down, and most of them remember, too, that in his voyage round the world Drake insisted that the gentlemen should " hale and draw with the mariners," which I think amounts to much the same principle.

I think also that it might be stressed, in relation to this subject, that the primary object of education is not to give knowledge, not to teach people strategy or tactics, or how to run a steam engine, but to teach them how to use their brains, just as we teach apprentices how to use tools. The secondary object of education is to give them some knowledge which will be useful in after life. Personally, I believe that, provided the course will provide for that primary object of teaching people how to think, it does not matter very much what the precise course is though it is clearly desirable that it should provide knowledge related to the job in after life. If we apply that principle to your naval problem, you want your Executive officers to be able to use their brains and to think about their strategy and tactics, but I do not think that it is going to be any disadvantage to them to be taught how to think along technical lines, by being taught scientific subjects and engineering, and only going off into their strategy and tactics and other subjects at a quite late stage in their education.

I should like to say, having been rather alarmed by the lecture, how much relieved I am to find this subject being seriously discussed in the Navy.

Captain (E) J. G. C. Given, R.N. : I should like to mention one point, and that is the question of training in the understanding of human nature and the handling of men. As I see it, that is learned partly in experience at sea, working with men ; but, also from the broader cultural education that the earlier generations received. As the scientific and technological curriculum becomes wider and wider there is a danger that the broader education which includes the humanities and possibly psychology will be completely squeezed out. I think that it is well recognized, not only in the Services but in industry, that a very large percentage of a man's job, particularly in the higher posts, relates to dealing with his fellow-beings and how to handle them. It is an aspect which should not be lost sight of, as an important training commitment which must be fitted in.

COLONEL F. H. SMITH: Will the Lecturer kindly tell us what parts of the Selborne-Fisher Report were adopted, or whether it was adopted *in toto*, by the United States Navy?

THE LECTURER: The whole of the Selborne-Fisher scheme has been taken over in the United States Navy, but naturally in the course of fifty years it has been modified. Broadly, however, there is only one Branch of Line Officer, who covers all specializations, including engineering, signals, gunnery, navigation and everything. They have their Supply Officers who are kept separate to a certain extent, but many of their Line Officers pass over to the Supply branch, so that they have a common training. The American Navy uses a very large number of specialist officers, who are given post-graduate training and are then known as E.D.O.s (Engineering duties only), but, quite apart from that, nearly half their Line Officers get post-graduate training, with a scientific degree of some sort at the end of it.

You must remember that American education as a whole is very different from that in this Country.

COMMANDER (E) P. S. WILSON, R.N.: I should like to make some remarks about the Air Engineering side.

The Lecturer said that a certain proportion of Air Engineer Officers were trained as pilots. It is essential for them to do a considerable amount of flying before they can successfully act as test pilots, and that takes a long time. Flying training takes about a year and the necessary experience about another two years. There is a tendency for them to get their wings and then stop flying. This is most unpopular with the flying side (besides being a waste of money) as they are usually senior to a lot of more experienced pilots and really they know practically nothing about flying. To my mind, it is essential that if they are going to fly at all, they must fly properly, and get some 800 to 1,000 hours flying, so that they can talk with some authority to the squadron pilots.

If they are going to spend that amount of time flying, then there must be a career open to Engineer Pilots: the time spent flying is frequently regarded as time wasted away from pure engineering duties. At the moment some have done the Empire Test Pilots' School course which is run to train pilots to carry out research and development testing and to give them some understanding of the problems involved. There have been seven full courses at the Empire Test Pilots' School, and on three there have been Naval Engineer Officers, and on each of these three courses the top naval officer has been an Engineer. I think there should be a future for Engineer Officers, with such experience as there are appointments at the Ministry of Supply and the Admiralty which require both a technical knowledge, and a knowledge of flying and development work, which at present are held by either pilots with no technical knowledge or engineers with no flying or testing experience.

THE LECTURER: The senior test pilot at Farnborough is an (E) officer, also three out of four test pilots at Boston Down.

ENGINEER REAR-ADMIRAL W. R. PARNALL: The Lecturer has raised two questions to which I should like to refer. The first is to what extent is the Executive officer wanting in training in modern techniques? Going back some fifty years, technical development found expression in the Navy chiefly in the mechanical field of engineering. When, in 1902, the Selborne-Fisher scheme came into being, my impression was that one of its principal objects was to put the Engineers into a more officer-like position than they had hitherto held. As the years went by, however, I began to look at it from a different aspect, and I think that the genius of Lord Fisher led him, with Sir Alfred Ewing and the rest of them, to aim, not so much at making the Engineers better officers as making the Executive officers better engineers. I think that it was realized that we were at the beginning of an era of technical development in which it was desirable that the officers should know what they were handling.

It was a lamentable thing that the first World War intervened before that scheme had come to full fruition and that, as a consequence, it was dropped. It would not have

mattered so much if the division between the strategical, tactical and navigational side, and the material side had been less, and they had been run more together.

My view is that to-day it is not too late to re-introduce the principles of the Selborne-Fisher scheme—if necessary in some modified form.

The other point which was raised and to which I should like to refer is the difference between the training of the mechanical engineer, the air engineer and the ordnance engineer under the auspices of the Naval College at Devonport and that of the electrical engineer, based chiefly on the university. In a technical training, my view is that the major necessity is to get down to the fundamentals. If you can get the fundamentals well into a person's mind, the next step is to apply them to a limited number of particular aspects; but to start off the training with the idea that you are going to instruct people in the complete details of every apparatus that exists on board ship is irrational, if only because such a training would take so long that by the time it was completed the stuff that the man learned at the beginning would be out of date. The technical applications in which we more elderly people are interested now are new, and quite different from what they were when we completed our courses, but the fundamentals have not changed. I would say, therefore, that what Sir Denys has told us to-day about the training for which he is immediately responsible suggests a succession of theory and practice which is first class.

There is one other point that I want to make. Fifty years ago, it was necessary for the engineer to learn to use tools and to become in some sort a craftsman. We do not have to do that to-day; we take out the old part and replace it by a spare, and maybe recondition the worn part in a factory. This new technique enables those who are essentially more users than producers to cover a wider field than formerly and thus to keep up with the times.

Captain R. Oliver-Bellasis, R.N.: I have frequently said that my generation owe a great deal to Lord Fisher for his ideas in giving to Executive officers fundamental engineering training, because I think it is essential that the Executive officer should have enough basic technical knowledge to be able to use his weapons to the best advantage. Modern machinery and technical equipment uses such scientific techniques that its intelligent use pre-supposes at the very least a basic technical education on the part of the user.

I feel, however, that there is some misconception at this Meeting, because the Gunnery and Torpedo Anti-Submarine Officers *are* actually responsible for their material, and I think this will remove a great deal of the criticisms of the present scheme of specialization. It is, of course, a commonplace to say that weapons are more complicated and the present Gunnery and T.A.S. Officer requires more skilled assistance than he has had in the past. Under the present arrangements I think he is getting it.

There is not time to go into details but I think it should be made perfectly clear that the modern "G" and T.A.S. Officers are responsible for the functioning of their weapons.

Instructor Captain W. A. Bishop, R.N.: The Engineer-in-Chief rather gave the impression that the 16-year-old entry Cadets and also the Special Entry Cadets came to a large extent from the classical side of schools. I do not think that that is quite correct. What is actually happening in these days of full employment and other attractions on the educational side is that we cannot get the full number of boys that we want on the science side, and we have to adopt the next alternative, which is to take boys who are eminently teachable. The best way, we think, of discovering their teachability is by entering boys who have taken Latin at school, because it is generally accepted that Latin gives a very good indication of a boy's learning capacity. Very few actually offer Latin in lieu of science, but those who do so and who are sufficiently good in other subjects in their entrance examination, are interviewed. If accepted, they are given a special course at Dartmouth in science, and as far as I know the results of that course are quite satisfactory. Of course, one cannot expect them to learn very much science in a couple of years, but it is better than taking boys who have only had training in what is called "General Science" at their schools.

With regard to those who enter by the Special Entry method, I think it is fair to say that in their written examination they have to take papers in physics and mathematics, so as to make quite certain that they have a fair grounding in science.

COMMANDER G. M. BENNETT, R.N.: I should like to raise a point on this question of User versus Maintainer. There is a difference between engineering in the old, narrow meaning of the word, i.e., as applying to the ship's propulsive machinery which the Executive officer only uses indirectly, and engineering in its more modern, wider application which includes weapons—guns, torpedoes, radio, etc., which are directly used by Executive officers. Prior to about 1938, all was reasonably well: we had Technical officers to deal with the propulsive machinery, and Executive officers who were responsible for both the use and the maintenance of their weapons. Why did we depart from this?

I suggest as one reason, that technical developments during the War years were so rapid that Executive officers felt unable to keep pace with them. They took refuge in the large numbers of Reserve Officers, particularly of the Special Branch, who became available, training them as experts in particular weapons—radar being a notable example; and, having thus "passed the technical buck" under the necessity of special circumstances, the Executive officer has since continued to allow the pendulum to swing away from the Selborne-Fisher conception, until it has travelled so far that a complete divorce between User and Maintainer is imminent.

I suggest that it is time we considered returning to something on the lines of the pre-war arrangement. Executive officers do not need to know how to design their weapons—that requires a technical expert, but it is both possible and necessary for them to have the limited technical knowledge required to appreciate what is involved in the proper maintenance of their weapons, without which, I suggest, they cannot use them properly and cannot get the best out of them.

MR. D. G. LEWES: May I, as a visitor, offer a contribution? I would do it on the parallel of the civil engineer. As I have heard the Discussion, one of the points of controversy is the training to be given for the high Executive officer. A civil engineer who is constructing a building need not necessarily know just how the bricks are made, but he must know how the bricks are laid; and not only bricks, but every other material which he uses he must know something about, as otherwise he cannot use it to the greatest advantage.

From my association as a civilian with the Navy and other Services during the War, I thought of the complexity of the contrivances on aircraft carriers in particular. I feel that any Captain of a ship, or indeed any Executive officer, should have, shall I say, a little more than just the fundamentals of the materials, the mechanisms, which he is using. Without that knowledge surely it would be impossible to adopt tactics, the practicability of which he must know first. That training, however long it may take him, seems to be absolutely essential; otherwise a high Executive officer in charge of a squadron could make a very grave tactical error.

CAPTAIN (E) A. D. MCGLASHAN: I think that the Lecturer intended to leave to the Meeting the question: is it agreed that the tendency which has been growing in the last thirty years, for the Executive officers' technical training to be reduced is the right tendency? I hoped that when Captain Oliver-Bellasis got up he would answer that question, because he is a typical product of the Selborne-Fisher scheme, but he evaded that issue. I hope that someone here will say whether he looks on that trend with equanimity.

CAPTAIN OLIVER-BELLASIS, R.N.: I think it is essential that the Executive officer shall understand enough engineering and science to be able to know what is going on. In the presence of all these distinguished engineers, I may mention that owing to my pressing a certain Chief to raise steam rather quickly we had to refit with a blown steam joint. If I had understood the problem better, I would have incurred more of my Admiral's wrath but less expensive refitting. With modern radar—we have four or five

sets all of which can be used in different ways—it requires considerable technical knowledge to get the best out of them. I think it essential that the Captain of a ship or the Admiral should understand sufficient about the technicalities to be able to do that.

AIR VICE-MARSHAL G. A. H. PIDCOCK: May I, as a visitor, raise a point of organization? I understand the Lecturer to say that the Electrical Branch was introduced after the Second World War, but I believe I am right in saying that there were R.N.V.R. Electrical officers in the Navy during the War. As a member of the R.A.F., I find that very interesting, because we are abolishing our electrical sub-specialization branch, and we are doing so for this reason, that we cannot give a career to an Electrical officer; that is to say, it is unlikely that he would get above the rank of Squadron Leader. I should be interested to know what the Lecturer thinks is the career open to a regular Electrical officer in the Navy, particularly in view of the fact that he is, I understand, a university entrant, and obviously has to be offered a career. For instance, can he become the Engineer-in-Chief?

THE LECTURER: I will answer the last part of the question first. The Electrical Branch is completely separate from the Engineering Branch. Eventually, I believe, it is the Board's intention that the Director of Electrical Engineering shall be an ex-Electrical Engineering officer of Vice-Admiral's rank, but at the moment the scheme has only been in existence for some four years, and it is manned mainly by rather junior officers. The whole Branch has not yet been properly formed; but there is a Rear-Admiral (L), i.e. (Electrical), at the head of it, and they have a number of Captains (L) and a still larger number of Commanders (L), and so on down the list.

AIR MARSHAL SIR VICTOR GODDARD: The Chairman at the beginning of this Discussion did try to stimulate a fight, but so far we have not really had it. I am most interested in the outcome of this Meeting. It seems to me that the Selborne-Fisher scheme recognized that to train a naval officer to be an upper-deck fighting man and at the same time to be a technician, meant that training had to start at a very early age, and therefore Osborne took Cadets at 12½. Unfortunately, that is the age of measles, mumps and other diseases, and there was so much sickness that in 1921, it was decided that the game was not worth the candle. That cut away the basic consideration—the long training of the naval officer, 7½ years, before he was commissioned.

The Lecturer has drawn our attention to the advantages of the Selborne-Fisher scheme and has shown that the U.S. Navy in effect adheres to it: they have specialists of every kind who are basically and alternately upper-deck officers. My question, which I think is fundamental, is this: is the United States Navy content with a lower standard of academic knowledge in its technical officers? Do they accept the technical school standard rather than the university standard, and can they make-do without our traditionally high standards of engineering technique and scientific knowledge? That is the basic question.

The Navy and Army technical branches train officers to very high standards in mathematics and in every branch of engineering science, so that they can get the equivalent of an honours degree. I suggest that the reason for that degree standard, by and large, is not because the majority of officers need to use the degree standard of knowledge which they have attained but to induce high quality candidates to enter, knowing that the qualifications they will attain through Service technical training will also be qualifications, eventually, for resettlement in civil life? I wonder whether that is a large part of the idea of the degree standard.

Quality attracts quality, and I am much in favour of securing the highest qualities, but I wonder whether the Services' technical branches require a high proportion of honours standard graduates—some, of course, are required for technical development and design. But should that be the aim for all? If not, then there might be a greater possibility of combining upper-deck and engineering careers in the Navy, if that is desired.

Parallel considerations apply in the other two Services. Perhaps the United States Navy succeeds with the Selborne-Fisher scheme, because they do not demand, universally, such high academic standards in their technical officers.

THE CHAIRMAN: I will ask Dr. Abbott, of the Ministry of Education, whether he can give us some information about United States' education.

DR. W. ABBOTT: I thought that this was a family affair, and so I have kept silent. I had the privilege of co-operating with the Engineer-in-Chief when he was formulating the present education system, so that I am not in a very good position to criticise, but I would say this, that I think that the current scheme for training Engineer Officers for the Royal Navy is just about as good as you can get. I have been profoundly impressed by what I have seen. I have also had the privilege of visiting the corresponding college for the Army, at Shrivenham, where they take the London external degree, and where they have, of course, post-graduate courses beyond that.

The Lecturer will not mind if I tease him on one point. He has not compared the two products of the future—the product of Manadon and the product of Cambridge. In the second case, you will have a man who has rubbed shoulders with the lawyer, the doctor, the physicist, the chemist and so on, getting the kind of broad training and the kind of influences which we rather like young men to have in their impressionable years. Will he be a better man of the world, a better product, than the Manadon engineer who does not rub shoulders with his fellow professional men in the same way, who sees no one but engineers, but who receives a first-class technical training?

The Admiralty scheme seems to be very excellent, but, if I may criticise one feature of it, it is this. At Cambridge, and indeed at Shrivenham, you have staffs with full academic freedom. They are civilians, and they undertake a fair amount of research, particularly at Cambridge, of course, and the undergraduates are in a research atmosphere the whole time. It seems to me that you will have to do something like that at Manadon in future: to undertake a good deal of research there and give your staffs a good deal of academic freedom, if you are going to keep the lead that you now possess—for I am sure that you do possess it.

With regard to training in the U.S.A., I have no shadow of doubt at all that the standards here in our graduate courses are, by and large, higher than those in the State universities in America. I do not think that you can generalize about education in the U.S.A. In certain colleges there, other than the State universities, the standards are high, certainly as high as we attain here. Sir Denys Ford is much more knowledgeable on naval education in the U.S.A. than I am, but I believe that the standards reached by the Service people in the American universities are not as high as we reach in this Country in our specialized establishments.

CAPTAIN (E) F. T. MASON, R.N.: I want to make one plea: I do not think that there has yet been emphasized at this Meeting the advantage of common training, common service and common employment for as long as we can possibly manage it before we specialize. I am sure that it promotes mutual understanding and sympathy as nothing else will do. At the moment we have not common training to the extent which I suggest is desirable.

COMMODORE R. HARRISON, R.N.R.: I would like to make one point on an aspect which has not been mentioned, and that is with regard to the recruiting and training of Reserve Engineer Officers before the outbreak of war. That is a subject which people in the past have fought shy of, and it has resulted in considerable difficulty, as I am sure the Engineer-in-Chief well knows. Perhaps he will tell us whether any real attempt to face that problem is now to be made.

THE LECTURER: I wish I could say that that problem had been faced. During the late war we had to take in a vast number of Engineer officers of all sorts and descriptions. Some—about a thousand, we got from the Universities; we got a few from industry—not a great number; and we found a great number of men in places like Lloyds Survey

and so on, as well as getting a number of unqualified men who ran small works, etc. It is a subject to which some thought has been given. As everybody knows, by the middle of the War the shortage of candidates for technical training was so acute that the Ministry of Labour produced 5,000 technical candidates from whom we got a number of engineers. The answer to all this is that in war you take anything you can get and try to train it as hard as you can in the shortest possible time.

THE CHAIRMAN

I suppose that I must be as good a person as any to endeavour to sum up this Meeting, chiefly because I was pre-Selborne-Fisher scheme and nobody ever tried to train me in anything technical, except that I did get my watch-keeping certificate in an engine room, and I did stoke one of the boilers of the " Terrible " for eight hours during a trial. That was about the sum of my knowledge of engineering as a youngster. I have never studied very closely any of the machines in a ship except the principal one, and that machine I have studied, I am glad to say, for 47 years. You will remember, if you have read *Our Fathers*, what Ronald Hopwood considered the most important machine, and, with all due respect to all the brilliant brains who invent and maintain machines, I am glad to say that the Captain of the Engineering College for Officers put his finger right on the spot. When we are thinking of the maintenance of these machines and the invention of them, we must not forget *the men* who work them, and I was very glad to see that man, of all men here, get up and speak on that very important subject.

Now, of course, in the old Navy—slightly before my time—the mechanics of the ship were ropes and sails, and so the Executive officer knew his mechanics, and Nelson was as good an engineer as the next man in his ship, and the fleets were worked that way. Then engines came along—and they are much better things to work with than sails if you want to go to windward. The Engineer Officers came, and we as youngsters started to learn a certain amount of engineering.

I think that the opinion of this Meeting is undoubtedly that *some* technical knowledge is required of all Executive officers. I do not think that anyone will contradict that, and I think that Admiral Parnell produced the key word there, that they ought to be trained in the *fundamentals* of anything that they have to work.

I venture to suggest that it has come out of this Meeting that it would be almost impossible for the Executive officer of a ship to know all the details. It has come out, too, that the Gunnery Officers and the Torpedo Officers are in fact in charge of the maintenance of their various instruments. A great many officers are Gunnery Officers, and many of them very brilliant Gunnery Officers, and they know a good deal about the mechanics of their business.

It came from one speaker that the university degree standard is unnecessary in Executive officers, and I am sure that it is. It came out that you have not the time to spend a long period at universities if you are going to understand your men. My friend the Engineer-in-Chief gave me to understand that the electrical specialists virtually do not go to sea at all until after six years training : I suggest to you that that is bad.

Someone mentioned that one of our great assets in the teaching of our specialists was that the students of engineering in the Royal Navy are part of the Naval Service, and I can back up the statement which was made that the young Engineer officers do in fact learn a lot when they go to sea as Midshipmen from working with the men. One young Engineer officer, who has worked with men on the lower deck and on the upper deck, became Flag Midshipman (E) to the Admiral in the Arctic. He happens to be my own cousin, and that is partly why I appointed him !

I was glad to hear the Director of Education tell us about the type of lads we are getting. He contended, quite correctly, that they are not all on the side where they learn Latin and Greek.

I agree so much with the speaker who urged that junior officers should get to know the ratings. I should like to see them spend more time with the ratings, because I believe that the officer must

> " . . . remember if he can
> Tho' machines be ne'er so perfect
> There are limits to the man."

I am delighted to see officers from the other Services here, because it helps us a great deal.

I have listened to this lecture with great interest, and I am most honoured to be here with my old friend, Sir Denys. We can safely say, in summing up, that the position of the Meeting is that they have enjoyed the lecture, and they entirely appreciate the fact that something must be done to see that the leaders in the Navy, whether they be of specialist branches or whether they be just the plain old salt horses, must have a knowledge of the machines with which they are working. (*Applause.*)

The vote of thanks to the Chairman was proposed by Commodore Harrison, R.N.R., and carried with acclamation.

THE TECHNICAL TRAINING OF ARMY OFFICERS

By MAJOR-GENERAL W. J. ELDRIDGE, C.B., C.B.E., D.S.O., M.C.

A LECTURE recently given at the Royal United Service Institution by Vice-Admiral Sir Denys Ford on " the Technical Training of Naval Officers of To-day " raises the question of the technical training of officers of the other Services. The following discussion of the problem as it faces the Army may therefore be of interest.

First, I should like to define terms. Strictly speaking, all training for war is technical, that is " of a particular art, science, handicraft, etc." The skill of the infantryman in the use of ground is thus technical, just as much as that of the sapper in building a bridge. But the word " technical " is usually applied to the mechanical arts and crafts and to their scientific background and so I propose to use it. I am indebted to Sir Denys Ford for the differentiation between " technical " and " technological," the former being defined as " proficiency in the actual art or craft," the latter as " the understanding or knowledge of all the sciences and processes, without necessarily the manual dexterity." The difference is important. But for clarity and because of the usual meaning given in the Army to the word " technical," I propose in this article to use " craft knowledge " to denote proficiency in the art or craft, " technology " in the sense defined above, and "technical" as a generic term covering both.

REQUIREMENTS IN TECHNICAL KNOWLEDGE IN THE ARMY

As I see it, there are four requirements for technical knowledge in the Army :— for the user, for maintenance and repair of equipment, for development of equipment and as a background for every educated soldier.

Technical knowledge on the part of the user of equipment is an obvious requirement. The Bren gunner must understand the loading, firing and care of his weapon. The tank crew must understand the technical processes of handling their tanks, driving, rangefinding, gunnery and day to day maintenance. The signaller must know his communication techniques, setting up stations, cable laying and the like. The engineer obviously requires a wide technical background to do his job in the field. All four of these require craft knowledge but the last two require in addition some technological knowledge ; they may be faced with problems whose solution calls for knowledge of the fundamentals underlying their craft.

Again, little need be said about the need for technical knowledge for maintenance. Modern equipments, tanks, radar, wireless, automatic weapons, are growing so complex that their maintenance requires wider knowledge, higher skill and more complicated tools than ever before. Both craft knowledge and technology are required here. The replacement of a component or the welding of a part requires craftsmanship. But the improvization of repairs from available materials requires some knowledge of strength of materials and design. The organization of repair on an extensive basis needs a wide knowledge of processes. Both involve technological knowledge.

To ensure the development of equipment which shall meet the demands of modern war, there must be officers who understand thoroughly user requirements and the scientific and engineering implications of these requirements. They must talk the language and understand the problems of the armament scientist and engineer and of industry so that they can guide the men who actually do the development efficiently and economically to the goal the Army wants. They must also be able to

seize on new developments in science and industry and apply them to the problems of war. These officers require both craft and technological knowledge, but especially the latter.

The last requirement is not so easy to define. Every officer who hopes to make his mark in the Service should have some knowledge, and the more the better, of the potentialities and limitations of scientific, engineering and industrial resources which can be applied to warfare. This knowledge does not apply only to the development of equipment but also to the use of scientific method in war as exemplified by the work of the Army Operational Research Group.

The Present Situation

The present situation as regards these requirements is as follows. Officers of all arms are expected to be expert in the technical knowledge—both craft and technological, required for work in their own arm or of the branch of it in which they are serving. The trained infantry officer will be able to handle technically as well as tactically the weapons in his battalion. The gunner will understand artillery survey and the technical handling and care of his equipment in whichever branch of the Regiment—Field, Anti-aircraft or Coast, he is serving. The sapper will be expert in the techniques of field engineering, of survey, of transportation, and so on. Officers from time to time will change their branch and will thus gather technical user knowledge of two or three branches of their regiment or corps.

In considering maintenance, it is advisable to go back into recent history. Before the formation of the Royal Electrical and Mechanical Engineers in 1942, the non-technical arms—Cavalry, Royal Artillery, Infantry, Tanks, carried out their own day to day maintenance and such minor repairs as could be done within the unit with their own regimental personnel aided by detachments of the Royal Army Ordnance Corps. Heavier repairs, requiring workshop tools, were carried out for them by that Corps. Technical Corps—Royal Engineers, Royal Signals, Royal Army Service Corps, carried out all repairs on their own specialized equipment and possessed workshop facilities for the purpose.

When R.E.M.E. was formed it took over many of the technical maintenance personnel of the other arms. It assumed responsibility for all but the simplest repairs of the non-technical arms, continuing to provide detachments with units. It also took over their heavier repair work, hitherto done by the R.A.O.C. At the same time it took over the heaviest repair work from the technical corps, leaving with them much of the lighter work.

This process of centralizing repair in R.E.M.E. is now going further, and in the end that Corps is to take over unit repairs for all units, including technical ones, other than those of the Royal Engineers, providing the necessary detachments to do the work in units. Unit personnel will continue to be responsible for the care of their equipment.

As this brief and incomplete account shows, by far the greater part of the repair of equipment in the Army will be the responsibility of R.E.M.E., whose officers will have to be technically competent to carry it out.

Development of equipment is carried out for the Army by the Ministry of Supply and is guided by the Technical Staff who work in the closest touch with the General Staff. Some Technical Staff Officers work in the War Office where they assist in formulating requirements, both qualitative and quantitative, for equipment. Others work on the Ministry of Supply Staff where they advise on these requirements, receive

them from the War Office, put them to appropriate establishments or to industry for development, progress them and finally approve the products. Others again work in research, design and experimental establishments and in inspectorates, where they help the research scientists and design and production engineers to see that the Army gets its needs. These Technical Staff Officers are regimental officers from all arms who have a good user background and have been specially trained for their technical duties.

As regards background knowledge of technical possibilities and limitations, there is no formulated standard or means of educating officers. But many officers of standing, by reading, by discussion, and by experience gained in appointments, have managed to obtain a fairly wide background of knowledge of the effect of science and engineering on war. Obviously officers from Technical Corps, in common with officers who have taken a science or engineering degree, have an advantage in this.

Technical Training

The facilities for providing technical training are, in outline, as follows :—Of the Officer Cadets who go to the Royal Military Academy, Sandhurst, for eighteen months, a proportion are encouraged to read mathematics and science up to the London Intermediate B.Sc. standard. A small number enter Sandhurst having already achieved this standard in the Higher School Certificate. It is hoped that, in future, an increasing number with degrees in Science or Engineering will receive Commissions direct from the Universities.

Beyond Sandhurst and for those who receive regular Commissions from emergency Commissions are the arms schools—the Royal Armoured Corps Centre, the School of Tank Technology, the Schools of Artillery, the School of Military Engineering, the School of Signals, the Infantry School, the R.A.S.C. Training Centre, the R.E.M.E. Training Centre, the R.A.O.C. Training Centre, and so on. These schools cater for the user technical training of their respective arms by running short courses on which the regimental officer is trained up to his user needs both tactically and technically. In addition, most of these schools run long courses to give advanced instruction and to train instructors. For example, the Schools of Artillery run Gunnery Staff Courses, the School of Military Engineering long Civil Engineering and Electrical and Mechanical Courses, the School of Signals a long Telecommunications Course.

Beyond these again is the Military College of Science—the main centre of technological teaching in the Army. It provides three types of course : it receives young officers some months out of Sandhurst and prepares them for the London External B.Sc. in Science or Engineering ; it takes the Technical Staff Course—a two-year course in armament science and engineering to prepare officers for the Technical Staff ; and it takes post graduate courses in special subjects when they are required. A certain number of officers go every year from Sandhurst to Cambridge to read the Mechanical Science Tripos.

Finally, by way of more general education, lectures are given at the Staff College, the Joint Services Staff College and the Imperial Defence College on the influence of various aspects of science on warfare. And at most of the larger exercises there is discussion on this subject with reference to the exercise setting.

Some Factors Affecting Technical Training

Before going on to a discussion of the present situation, there are certain hard

facts of life which should be stated, because what is desirable has to be set against what is possible, and these facts very much govern what is possible.

The first duty of an officer is to lead and to command others. His character must therefore be trained and he must spend much time with troops to acquire and practice all these attributes needed by a commander in his relations with his command. Then, his business is war. His training and his service—particularly his earlier service—must be balanced. Important though his technical training and experience are, they must not be allowed to outweigh his tactical training, which indeed must lead. It is true that an officer may later specialize in weapon development, in survey, in telecommunications or in some other technical matter. But he must have at the back of his mind that the shell he develops has to be fired by a gunner to kill or neutralize an enemy soldier, and that the map he makes will be read by a tired infantryman in half light, in rain and under fire.

The standard of entry to Sandhurst both in intellectual quality and in knowledge varies from time to time. With the increasing complexity of modern war, increasing intellectual demands are being made on our officers, and we want men of the highest quality. But we cannot afford to neglect character for intellect; both are wanted. Moreover the time available at Sandhurst is all too short. Its curriculum has to be wide and it has to develop all sides of its Cadets. There is a limit to what can be done there to make up educational deficiencies.

There is a shortage of manpower. Every officer on a course has to be replaced in his unit or his unit has to go short. There is a limit to the number of non-effective officers the Army can carry.

There is a shortage of money: there always is. Schools are expensive, and every non-effective officer seconded as a student is one more officer to be paid from the Army vote.

There is a shortage of time. An officer is commissioned at perhaps 20 and becomes a Lieut.-Colonel, or perhaps Colonel before he is 45. Into that twenty-four years or so has to be crowded, not only his own training and experience, but as long a period as possible of useful service when he in turn is giving what he has received.

All these factors point to the necessity for the most rigid economy in training time and for a proper balance between the various aspects of training to ensure efficiency. And they should be remembered when criticizing our standards of training, technical or tactical.

A Critique of the Present Position

The foregoing is a very brief and incomplete outline of the position as regards the technical training of officers in the Army. The question at once poses itself as to the extent to which the requirements stated earlier are being met.

Is the basic technical training of the officer adequate to his user needs? The factors relevant to this are the quality of the Officer Cadet when he arrives at Sandhurst, the amount he has to absorb as a cadet and later as an officer, the standards required of him, the time available for training and the quality of that training. I think it fair to say that as the result of long experience the quality of the training at all our schools is high. The amount of knowledge to be absorbed and the time to be allowed have been worked out, for every arm and for every speciality within arms, after exhaustive discussion. The standards attained vary very much with the quality of entry. As a generalization, it is probably true to say that for the non-technical arms, the technical training is adequate, if barely adequate, for user

requirements, and that on the whole the required standards are reached but without much in hand. For the technical arms, the standards attained are adequate for a proportion of officers but lower standards than are desirable have to be accepted for the remainder, and this limits their employment. It is a continual struggle in most of the Technical Corps to ensure that as many officers as possible are brought up to the requisite standard in the time available. More time and higher standards of entry would ease the situation greatly.

Is the standard of technical training for maintenance adequate? The system of centralized maintenance brings with it a danger which must be watched. In the past the responsibility for the care of his equipment has rested squarely on the commander of a unit. As equipment gets more complex and difficult to understand, and as minor repair is done more and more by R.E.M.E., there may come a tendency for unit commanders to feel that the maintenance of their equipment is wholly a matter for R.E.M.E. and that they are not concerned. It is, however, recognized that there can be only one man responsible for the maintenance of the equipment of a unit; that is its commander. A very clear demarcation of the responsibilities of the unit commander and of R.E.M.E. is therefore required. In order to carry out their responsibilities, regimental officers will need sufficient technical knowledge of their equipment—beyond their user technical knowledge—to see that it is properly cared for and to decide problems such as accepting delay in repairs to meet tactical exigencies, accepting minor repairs instead of major ones to save time, with an understanding of the technical as well as the tactical implications of their decision. The arms schools will have to cater for this.

R.E.M.E. themselves also have a difficult technical training problem. Not only have they to train officers to supervise maintenance and repair of equipment ranging from vehicles and guns to predictors, radar and wireless, involving detailed knowledge of mechanical, hydraulic, electrical and electronic engineering, but they have also to train officers for senior posts where they will direct and plan maintenance involving all these branches of engineering together. And all this is in addition to their needs for tactical training.

Both user and maintainer require deeper and wider technical knowledge if maintenance is to be successfully carried out.

Is the method of training Technical Staff Officers for development work satisfactory? It is early yet to say. Before the War, these officers were so few that they had little chance of returning to regimental duty to refresh their user knowledge. In consequence they tended to become over specialized on the technical side. A deliberate attempt is now being made to avoid this both by insistence on the return of officers to regimental duty at intervals and by giving them more training on the user point of view. But this policy has its own drawbacks: there is more to be learnt and less time in which to learn it. It is only by some degree of specialization that standards can be maintained. All that can be said now is that the post-war products of the Technical Staff Course seem to be performing satisfactorily. It will be three or four years before it will be possible to criticize their training from a real basis of experience.

Does the officer of the non-technical arms get a sufficiently wide technological background to enable him to appreciate the potentialities and limitations of scientific discoveries and methods in relation to war? I suggest that it is very doubtful. For the officer who is interested and who has had the educational basis to appreciate what he reads, the popular articles in the press and in periodicals, and popular works

on science together with more technical periodicals, if he reads them, has given him what he wants. Lectures and discussions at exercises help also. But many men's tastes run to history, languages and other " Arts " subjects rather than to science, and many of these men have not had the teaching on the science side which might arouse their interest. The frontiers of science are advancing rapidly. Quite apart from the weapons of mass destruction, modern developments in radar, which has only been in use in the Army for ten years, in electronic computation, in television techniques, in servo-mechanisms, and in many other fields, are likely to have a profound effect on equipment, and through it on tactics, in the next fifteen to twenty years. The educated officer should at least be generally aware of what is going on and be ready to make use of these developments as they are offered. He must also be aware of advances in operational research. In the future, this background knowledge will be an increasing necessity both to those who direct policy within the War Office and to commanders in the field.

Conclusion

This is a very brief review of the situation on the broadest lines and from one point of view. Much has been omitted and there are other points of view. But certain things seem to stand out.

We find difficulty in bringing all our officers of Technical Corps up to the desired standards. The general technological background of officers in general should be higher. These deficiencies could be corrected if certain things could be done.

We want a larger entry of men to Sandhurst with technical leanings and a knowledge of mathematics and science, though they must be men of character first. We also want them with the historical outlook so that they can apply the lessons of the past to the future. These men exist. But many young men leaving school with science or engineering leanings naturally enter these professions rather than the Army. It cannot be too widely realized, however, that the Service offers such men an interesting career in which they can serve their Country and the cause of peace while still satisfying those leanings.

We want more time for training. Some factors affecting this have been set out above and the problem is not an easy one. One looks with longing at the four-year course at West Point or Kingston, and one wonders whether we could not take our men earlier, perhaps at 17, and give them longer at Sandhurst : it would make such a difference to the product. In any event we must exercise the greatest economy in training time to get the correct balance between technical and tactical training.

But in spite of these criticisms I believe that the technical training of our officers is on the right lines. It gives us a proportion of technically high grade men and many more of adequate standards, and it caters for our regimental user needs. Above all it is flexible and from it evolution is possible. It is part of the British genius to evolve, often after much controversy, freely expressed. But we must evolve. There will be two classes of armed forces in the future. One will be based primarily on the highest grade equipment manned by skilled men of high morale with the knowledge to make the most effective use of it. The other will, by reason of lack of technological and industrial resources and skill, be forced to rely on masses of manpower with comparatively obsolete weapons. There is no question as to which of these two classes we must belong.

PRESENT SCIENCE AND FUTURE STRATEGY

By Dr. O. H. Wansbrough-Jones, C.B., O.B.E.

Sir Henry Tizard, G.C.B., A.F.C., F.R.S., in the Chair

On Wednesday, 15th February, 1950

The Chairman: We are going to have the privilege this afternoon of hearing an address from Dr. Wansbrough-Jones, Scientific Adviser to the Army Council. I do not think I need give him any further introduction. I should, however, like to make one remark. I think that it is a sign of the enlightened times in which we live and of the forward looking policy not only of this Institution but of the Service Departments that a scientist should be asked to address you on some aspects of future strategy.

LECTURE

MY lecture is entitled "Present Science and Future Strategy," therefore I do not have to prophesy about science—where my guess could later be proved to be wrong, but only about strategy, in which art incorrect prophesy is more likely to be condoned.

Broadly, the position of science and its particular relations to military matters is well-known to you. In the twenty years between the two Wars there was a tremendous extension of the bounds of scientific knowledge. I can exemplify this rate of growth in three ways. The funds spent in civil research by the Department of Scientific and Industrial Research in 1920 were of the order of £330,000. In 1939 this figure had risen to around £700,000, and in 1948 to £2,700,000. In industry itself, under £2,000,000 was spent in 1930; in 1946 over £20,000,000. Expressed in terms of publication, this had at least doubled in the period under review. This gives some quantitative idea of the rate of growth. Qualitatively, one recalls at once the great steps forward in the description of atomic structure and in nuclear physics in general with the increase in elementary particles from two, the proton and the electron, to perhaps eight, and with a fairly accurate description of the energy relations of these several particles. We saw the general adoption of the relativity concept, and we saw selections from the results of this pure scientific work ultimately developed for the special purpose, invoking also all the aids of our rapidly extending technology, of the design and production of the first few atomic bombs.

In a similar way, what started by being the scientific exploration of certain electrical properties of the upper atmosphere led inevitably to the development of radar, this application being perceived by a few outstanding men. The detailed development in three or four years before the War by a slightly larger group still provides what many regard as the pattern for the joint application by members of the Services and by scientists of a scientific idea with a defence use. In this field the urgent stimulus of war produced technical development over a wide field as witnessed by the growth of the whole electronic industry.

In the chemical field it may appear surprising, when the amount of fundamental work in general chemistry had reached the volume it had in the years before the War, that there was no outstanding development in pure or applied chemistry that materially affected operations. But in those subjects that border chemistry, biochemistry and chemotherapeutics and the like, the pioneer work of Fleming on penicillin was translated, largely by Florey and his colleagues, into large-scale practice, so that penicillin became the great life saver it is. The selective use of vitamins and our greater knowledge of nutrition must be held largely accountable for the continued

good health of the Services, and far more, of the civil populations of the World under the prolonged strain of six years of war. The developments in techniques of blood transfusion, again calling for applications under pressure of war of principles that had been discovered by patient research, is another of the many examples of science applied to a practical end. In this case medical science was invoked.

In the engineering field we have seen the coupling of aero-dynamical studies on the one hand with progress in power units, evolved by linking thermo-dynamical principles with modern metallurgy, jointly leading to the great increase in aircraft performance that was another outstanding characteristic of the late war.

These exemplify the use in the period 1935–1945 of what could properly be described as present science in or around 1940. The profound influence of these developments on the strategy of 1940–1945 needs no stressing.

My proper task now is to consider what is the present state of science, how it can be applied, or, as some would say, misapplied to weapons of defence in the not too far distant future, and what would be the effects of such application on future strategy.

In the examples that I have just quoted I remarked that there had been no outstanding contribution from the field of general chemistry; but there had, of course, been a number of very useful contributions, improved explosives such as R.D.X., insecticides such as D.D.T., and many other examples can be given, but there was nothing of the same novelty or magnitude as appeared in some other fields. The same kind of generalization might have been made one hundred years earlier about classical mathematics which, in preceding generations, through its contributions to the fields of navigation, ballistics and the like, had been of greater service to defence than any other branch of science; but its new contributions were small.

It is obviously excessively difficult to forecast the fields in which, in the future, science will contribute most, so it may be thought reasonable to adopt any line of argument that may guide us in such a forecast. I want to suggest to you that the well-known biological growth curve can possibly be used, with many reservations, to assist us in this forecast.

This biological growth curve is in itself a composite generalization: in elementary cases it can be derived from simple algebra, it may also appear to follow almost directly from the application of common sense, or it could be regarded as a formulation of well-known facts. It simply expresses, in the form of a curve, that anything that grows—child, plant or Country, institution or technique, if it is not hindered too much by external attack but flourishes as major sciences have obviously done, does so according to a general pattern. Things grow in three continuous phases, a slow rate of growth, followed by a much more rapid expansion, followed again by a period—the period of maturity, in which the growth is very small. Expressed as a curve, plotting a dimension against time, this looks like the letter "S," inclined forward, or, more pictorially, like a snake preparing to strike. By using the general conception that this is the way things grow, and by making more rather arbitrary assumptions as to where we are on this growth curve at any particular time, one is sometimes guided towards reasonable forecasts of future developments.

I now assume, having tested this assumption against a variety of cases, that, as one would have expected, a growing science is most likely to throw off new and major contributions to defence, or indeed any other type of endeavour, when it is in its period of rapid expansion. Let us take one or two examples.

Chemistry began its great period of expansion in the middle of the last Century. Up to that point, apart from the almost haphazard and certainly unscientific introduction of gunpowder, it had made little or no contribution to the art of war. In the great growing period of chemistry as we normally know it—say the period 1850 to 1930, there were innumerable contributions. Explosives, most of the modern materials, processed or synthetic, poison gas and so on, were the direct result of the application of chemical knowledge.

The 1914–1918 War was called by some a Chemists' War, but I hope none will be misled by its static nature into thinking that that adjective characterizes my own profession. Now, however, apart from certain efflorescences, the period of rapid expansion of the central field of chemistry is probably at an end. The height of growth as exemplified by the enormous volume of publications is maintained; but the novelties are less obvious. In other words, we may have reached, in this science, the flattening out of the top portion of the growth curve, and it may not be surprising if the chemists' contribution in 1939–1945 was less significant than that of the physicist.

It would be foolish to contend that there would be no more important development from the chemist; indeed, merely to keep up-to-date and to maintain parity with possible opponents, a large chemical effort must be devoted to research in explosives or in new materials; but it appears improbable that there will be developments from this field that will more than marginally alter the effectiveness of the weapons and equipment that are primarily based on chemical properties.

Much the same reasoning applies to normal mathematics. From the applied forms there may be much more to learn, but we can obviously only expect refinements from the mathematician in techniques of which we already know a great deal.

But let us take the three other forms of science that I mentioned earlier, nuclear physics, some forms of biology, and aeronautics. It is perfectly plain that, speaking scientifically, we are in neither of the flat portions of the curve—the beginning and the end, but in the rapidly rising middle section. The difficulty is to assess in which part of that rising curve we are in 1950.

Speaking of nuclear physics, perhaps one can say that the curve began to turn sharply upwards in the early 1930's, and by 1939, when it became a near scientific certainty that an atomic bomb could be made, it was definitely in the steeply ascending portion. The speed of growth can be shown both by the enormous increase in publications, although much information cannot yet be published, and by the sheer technical achievement of the atomic bomb itself. Yet it is known to all scientists that strict concentration on an objective—in this case the production of the atomic bomb—means that many promising and fascinating paths of investigation have to be left unexplored. Since the War, scientists have been able to return to many of them and new light is being shed every day on the problem of the structure of the nucleus. Quite apart, therefore, from the development of atomic energy for peaceful purposes, which is still, mercifully, the main end of our research and development, the indications are that the atomic bomb as we heard of it in 1945, is very far from being the end of possible applications to war of nuclear physics.

When I first started to prepare this lecture I had hoped to be able to avoid any specific reference to bombs several orders of magnitude more powerful than those that have already been used, but, as so often happens, the public and political importance of the discussions relating to the super bombs have resulted in a con-

siderable discussion in our newspapers of what is now called the hydrogen bomb. I shall, therefore, regretfully, both on grounds of security and my own highly imperfect knowledge, be obliged to return to this point a little later.

I mentioned the rapid growth in some of the biological fields, especially those fields in which biology borders on the more developed sciences—mathematics, physics and chemistry. I do not suppose that any scientist would deny that here, too, is to be found a number of growing points of science, indicating again that sort of period of rapid expansion which is likely to lead to results applicable for good or ill in the field of defence. On the one side we have the prospect of bacterial warfare—more accurately biological warfare, to express the possibility of attack by all manner of micro-organisms or their products on men, animals and plants. On the other, we have the possibility, almost the certainty, of new means of treatment not only of value in combating this still hypothetical biological warfare, but of certain value in meeting hazards, of which sickness has always been the greatest, to an army in the field. I select this large field, then, as the second from which important defence applications are bound to emerge, which it will be well to discuss in a little more detail later on.

In the field of aeronautics the growth curve is easier to plot for one can take, as I have done, speeds, weights, ranges, or what you will, plot them against time, and it is evident that we are well into the rapidly ascending part of the curve.

Unfortunately, there is no way of seeing when this curve will begin to flatten out, but I think I dare suggest that the important developments are already fairly definitely foreseeable and specified; that the conditions which will limit aircraft performance in the future are getting fairly well-known; and that while increase in performance will be far more than marginal, the limits and the penalties that must be paid, whether in loss of manœuvrability, greater cost in upkeep, costlier landing fields, and so on, can already be foreseen.

It is not for me to speak in great detail on the influence of air power in the next war; others far more competent than I am have done so already; but it may be a contribution in this particular talk to stress one's strong expectation that the real revolution in air warfare was exemplified in the late war, and that a next war is likely to show rather less development in aircraft since the 1939–1945 era, than the use of tanks showed in 1939–1945 since the 1918 era.

These examples that I have taken are simply intended to exemplify the general method of approach I have used in selecting those fields of science which I believe to be in a state at present likely to lead to developments that may affect future strategy and to reject those fields which, at the moment, I believe will not. I am most anxious to make it clear that this growth curve conception is not by any means an exact one, it is more a method of thought than a scientific analysis, but I think it does provide some discriminant.

I suggest, therefore, that we can still look for important developments in defence from nuclear physics, from those fields of chemistry that reach into other sciences, particularly bio-chemistry, from certain fields of biology including bacteriology and preventive medicine; psychology as it becomes—and it is becoming—more exact, may bring its dividends increasingly into fields in which it is now being applied, selection of personnel to economise manpower, and new types of equipment and even, conceivably, in newer fields such as true psychological warfare.

I suggest that in almost all other fields of active endeavour, such as classical physics, general chemistry, electronics, aerodynamics, mechanical engineering, and all the other sciences with a more remote application to war, such as geology, pure physiology, botany, and so on, the development will be the straight improvement of 10 per cent., 20 per cent. or 30 per cent. which, of course, must be allowed for both in tactics and in strategy, but which will really do no more than enable wars to be fought in very much the same way as was the last.

There is one word of warning that I must utter here before considering where the major changes may come. Although I have suggested that the changes are generally progressive and continuous, there are occasions when changes are discontinuous or cyclic. By this I mean that you may have two directly opposing weapons, e.g. tank and anti-tank guns, fighters and bombers, submarine and submarine hunter, in which relatively small increases in performance by the one with no alteration to the other, may completely tip the scales in favour of the former. Of course, when this happens there is a temporary disequilibrium which may have a very considerable effect on tactics (though perhaps not so much on strategy) until it is rectified by the corresponding increase in performance of the contestant that lagged behind, which will most assuredly come about. This is really a case where the saying that every weapon brings with it its own remedy is true, but I shall have occasion later to refer to cases where it may not be.

For these fluctuations which may be important in themselves it is quite clear that any generalization on science of the type that I have used will not suffice. To study them in detail, however, would take far too long and, I think, is not properly within the confines of this lecture, for the results of this disequilibrium will surely be tactical rather than strategical. I, therefore, come to those major developments that I believe will affect strategy in the future and which may have to be understood by Commanders in the future.

THE ATOMIC BOMB

Dominating them all are, for I suppose we must now use the plural, atomic bombs. In the four and a half years that have passed since the first three were exploded it is remarkable how much more closely their true effects have been appreciated and how little has been done about it, apart from any progress in their manufacture and the design of new ones.

I am sure that the basic properties of atomic bombs of the Nagasaki type are well-known to you. You know that one bomb is believed to have killed 70,000 people and seriously injured a like number; you may remember that the British Mission which investigated the site summed up by saying that they would expect one atomic bomb to devastate some three square miles in a British city and to kill 50,000 people. The first figure is probably not open to much variation, the second, the number of killed, can be reduced by the warning received, the shelters that are available and the use to which they are put. Previous evacuation and strong air defence must all greatly reduce the number of casualties, but on a town no reasonable person can suppose that the effect would be much short of disastrous. To a degree the effects can only be minimised, but never removed. What should be borne in mind, though, is that there is still believed to be a restriction on the number available and there is, therefore, a considerable requirement for accuracy. To try to maintain a balance, too, it is useful to follow Blackett's line of reasoning and accept for the moment the conception that an atomic bomb, though it may be the equivalent of

nearly 20,000 tons of T.N.T. burst in one charge, gives in reality effects on structures more closely equivalent to the damage caused by 2,000 tons of high explosive bombs ideally disposed in a pattern on the ground.

During the late war, about 1¼ million tons of bombs were dropped on Germany by the strategic air forces, sometimes at the rate of 100,000 tons a month. Many of us have seen the destruction that this caused in Hamburg, Berlin and the Ruhr, and yet believe that bombing by itself, however heavy, will never win a war, and if it does, its aftermaths may be nearly as unpleasant for the conquerors as for the conquered. Extension of this line of reasoning has led many military thinkers and scientists to believe that this old-fashioned atomic bomb, to which I would never wish to be disrespectful, is perhaps not quite the potent war winner that at the end of 1946 it was felt to be. Military thought has settled down very steadily into the rational belief that, terrible as it is, it may not after all be all-powerful. I shall have a little more to say about this aspect when I move further from the scientific into the strategic part of my lecture.

We have, however, now to consider a bigger bomb, a super bomb, and in order to avoid two handicaps from which I suffer, security on the one hand, ignorance on the other, I propose to rely on newspaper reports and broad scientific principles that are known to anyone with a rudimentary knowledge of nuclear physics.

THE HYDROGEN BOMB

Some four months ago, a television broadcast from New York (see *The Times*, 1st February, 1950) caused a considerable stir through the release by an American senator of what was then thought to be a secret of the highest national importance. A Washington correspondent has lately suggested that this may actually have been a calculated indiscretion. Talk about the super bomb, or the hydrogen bomb, became less guarded, perhaps more correct and more forceful, as it became clear that a major political decision was about to be taken. It was possibly a decision of the same magnitude as the earlier one when it was first decided to embark upon the manufacture of the original atomic bomb.

Scientifically, it has long been believed that the energy which the sun continuously pours out is derived from certain nuclear reactions, ultimately the formation of helium from hydrogen, in which process a considerable amount of mass is lost to be released as energy. How great is this energy is quickly appreciated from the fact that the disappearance of one ounce of any kind of matter leads to the release of energy equivalent to the supply of one million horse-power for nearly forty days. The manufacture of one ounce of helium from a very little more than one ounce of hydrogen would represent one million horse-power for seven hours, for in the process a shade less than 1 per cent. of the mass is lost. This process, or rather an indirect and complicated one leading to this result, has been thought to be proceding in the sun, where of course temperatures are incomparably higher and pressures much greater than they are on earth.

It is no novelty to suggest that if this process could be carried out on Earth, the uncontrollable release of a vast amount of energy could come about.

A few years ago the possibility of doing this terrestrially must have been considered very remote, and it might not have been unfair to compare the possibility of developing a super bomb, from the known scientific facts, with the possibility in the early 1920's of developing an atomic bomb as we now know it; Rutherford having produced the first artificial disintegration of atoms. But we must make

allowances for our growth curve again. Things move much faster now, new techniques are available, and there is the first atomic bomb itself which is generally thought to provide conditions of extraordinary temperature and pressure, not merely comparable to, but greater than, those in the interior of the sun. So the question became serious: was it time to put pressure on the development of a super bomb? Perhaps the retiring Chairman of the Atomic Energy Commission—Mr. David Lilienthal, summed it up neatly, according to Press releases, by saying it "was not a naked question."

For example, it must have appeared unlikely that energy obtained in this way could ever be used for any peaceful purpose and, therefore, improvident to spend our valuable resources on a weapon as yet unproved and of use uncertain. Plainly a further great effort in money might be required: estimates have ranged from 4,000 million dollars down to 100 million dollars.

As it has been announced that the hard decision to authorise this new venture has been taken, one must speculate now, as later those in the know will be obliged to calculate, the probability of the success of the venture and its effect on strategy if and when it is successful.

I do not care to speak much on the probability of its success; but one can argue from the fact that the decision to go ahead has been taken by those who know most, and from the general experience that the technicians will generally succeed, given good backing, and that in due season the super weapon will evolve. As to its power and effect, I can still only speculate or refer to the daily Press.[1]

Scientifically speaking, certain hints have been given. Physically easier processes than the indirect formation of helium from hydrogen are seemingly preferred. Thirring from Vienna suggested, for example, the use of lithium hydride, or the simple reaction of two deuterons—the rare heavy form of hydrogen, to give helium would obviously ease some technical problems, and the use of the much more rare variant of hydrogen—tritium, has been suggested. It would be out of place here to suggest which, if any, of these would be the methods of choice, but they have one thing in common, namely a fundamental limit in the original atomic bomb, the necessity for keeping the fissile material below the critical mass, which thereby sets an upper limit to the explosive power of the bomb is, probably unhappily, removed. Technically, of course, there remains a limit to the size of weapon that could be produced, but scientifically there may be none. Thus we have no published scientific fact to guide us and I must fall back on the common speculation that this super bomb might be a thousand times as powerful as that used at Hiroshima. It was proposed in the same article that such a bomb would wipe out every living thing from an area of fifty to a hundred square miles. Dr. Urey has observed that while he would not vouch for the fact that if such bombs were dropped on the Pacific Coast the prevailing winds would carry the radio-activity over the United States and result in the extinction of all forms of life, he asserted that the effects of the radio activity would certainly be far greater than those so dramatically exhibited at Bikini.

I am not disposed to argue about the effect of radio activity, but I must tell you that it need be no great exaggeration to say that bombs a thousand times as powerful as the earlier one would, in fact, demolish everything on the surface over an area of fifty to a hundred square miles.

[1] The general article on the hydrogen bomb in *The Times* of 28th January, 1950, provides an excellent background.

I think it is far too early to try to decide in detail what this possibility means to strategy in general. But it may be too late if we do not begin to think about it, even as a remote possibility, or something which may have radical political consequences. It would be well to avoid the surges of emotion and fear that were, for a short time, in men's minds in 1946, but it is also well to appreciate the almost tragically small effect that these thoughts have now, as things like this have fallen more into the background of the mind of the ordinary person in his daily life.

You will agree, therefore, as reluctantly as I do, that the possibilities of a major contribution to warfare of nuclear physics are, unhappily, far from exhausted. I must now offer to you a few reflections from the biological field.

Here again I want to do no more than draw upon public statements from everyday scientific knowledge, but in this field one is far more limited, for there is no experimental trial similar to the demonstration at Nagasaki and Hiroshima. There are, therefore, certain elementary facts which can, and have been, expressed in different ways sometimes according to the momentary emotions of the speaker.

BIOLOGICAL WARFARE

For example, weight for weight, the potential toxicity of certain bacteria is obviously many million times greater than that of the most lethal poison gas, for the former have the faculty of reproducing themselves within a living body, while the latter has not. One can, therefore, state truthfully, as did a senior member of the World Health Organization in Switzerland last year, that some seven ounces of a certain material would suffice to kill every man, woman and child alive to-day. So it would, in the unlikely event of all men, women and children submitting themselves to the deliberate injection of the precise amount of the material required, but I think we can disregard this possibility. On the other hand, there have been those who would prefer to disregard the possibility altogether on the grounds that diseases of all kinds are always with us, that it is the task of preventive medicine to prevent their natural spread, that no means are foreseeable of producing their artificial spread, and that preventive medicine has been advancing on all fronts rapidly for fifty years. Plainly what is needed is the study of all aspects of defence against deliberate attack with biological agents.

I want neither to frighten nor to reassure you on biological warfare. I would like to say to you that patently it is a field in which scientific knowledge is extending extremely rapidly. I cannot say how far it is extending in the special field of the application of bacteriology to warlike ends though any of you can find more reference to it in an article in the scientific press (Rosebury and Kabat, *J. Immunology*, vol. 56, May, 1947). The means of defence are certainly extending very rapidly, as new types of prevention and new types of treatment are being introduced. The immense measure of control of malaria by paludvin is one example, the cure of scrub typhus by chloromycetin is another.

Perhaps I have said enough to indicate that the matter of biological warfare, its success or failure, is again not a naked question, but that the means of offence may be nicely balanced with the means of defence and it would be a foolhardy person who would prophesy now which would prevail. Nevertheless, I believe that we get some comfort about this field, that in the similar field of atomic warfare is denied, for three reasons.

There is, firstly, no certainty that it can be used. Even assuming the worst, that it could be successful offensively, there is a plain possibility that the means of defence would have overtaken it before this came about.

Secondly, this is an example of the interplay between research for warlike and peaceful ends. The possibility of biological warfare sprang from bacteriological research, carried out in the hope of learning more about disease to the end of curing it. If any study of the specific use of bacteria to war is carried out, it is inevitable that some of the researches will be directly applicable to medicine. There are perfect analogies for this from the field of chemical warfare in the late war, that threw up as bye-products some of the most valuable remedies for use in certain diseases.

Thirdly, without wishing to indulge in special pleading, you may care to consider whether the direct attack on a man's body, carried out in such a way that still leaves him with the resources of modern medicine, is any less humane than an attack by explosive, fire, or bullets, let alone the atomic bomb. I have referred already to the need for the study of defence against this weapon. Ardently pursued, I would venture the prophecy, even supposing—and it is certainly not proven—that biological warfare might become a reality, that in the end a defence would prevail.

AERONAUTICS

The third major field in which I suggested that the growth curve gave some indication of probable progress was in the general field of aeronautics. I said that, while it was still in the state of rapid growth, it appeared that the extra penalties that would be incurred by the demands for increased performance were fairly clear to foresee. I think that conventional aircraft as we know them are, with the exception of the introduction of the jet engine, the product of fairly consistent development over a period of twenty-five years or so. If you take any single aspect of performance, and the maximum speed obtained may be as good as any, and plot that against the year, it is apparent that general aeronautics had for some time now been on the rapidly ascending portion of the growth curve, and, though the shape of the curve gives no indication of when it will begin to flatten out, one may surmise that the flattening out stage may not be so far off.[2]

This, of course, does not mean that there will not be considerable advance, for assuredly there will be, and it is quite possible that some of the ancillaries that now limit aircraft performance commercially, as, for example, conditions of weather or cost per ton mile on the one hand; or militarily, where limiting factors may be initial cost, accuracy of final navigation, ease of maintenance, or ground facilities required, will be very much eased, so giving a considerable improvement in the general commercial or military value of aircraft. But I do surmise that the order of improvement is likely to be of similar order for both sides and measured in percentages and not orders of magnitude. I suggest, too, that future thinkers on military matters will come increasingly to regard the air as a vital factor in all their operations, a major partner in all forms of warfare, but one that operates primarily in association with other arms and not in isolation. To a degree the history of the tank may provide an analogy. There was a period between wars when some military writers thought that the tank, improved in armour, mobility, and fire-power, would essentially be the dominant factor on the battlefield. Experience in the late war showed that the three improved characteristics required were to a degree incompatible, that the best compromise could easily produce an equipment whose general performance was inadequate, special performance low, and cost high; and which was relatively ineffective by itself. Look at it how you will, I do not see how advances in aeronautics

[2] *Vide* diagrams illustrating the lecture on "Aircraft Development," by Sir Frederick Handley Page, facing p. 21 of the JOURNAL for February, 1950.—*Editor.*

are likely to produce equipment of such superior performance as seriously to alter general strategy. In one way only it could: if any Power fully accepted this view and pursued it to the illogical conclusion of ceasing to do research and development in this field, sitting back, so that its aircraft became slightly inferior in performance to the improved types of others. We should then have an example of the cyclic variation I mentioned before, whereby a failing in one field can temporarily upset the balance. This may provide an interesting example of how one must, as it were, insist on progress, or spend a great deal of money, even to remain where one was before: a problem you will remember once encountered by the Red Queen.

I had several other rather more speculative examples of growth in scientific fields to which I do not have time to refer in any detail; for example, there are the possibilities of psychology. These were explored empirically by Hitler and Goebbels and, as we all know, produced remarkable results. One day, the appropriate science may advance so far as to allow proper measurements to be taken, so that the scientific basis for psychological warfare, and the practice of it, may be improved.

SEABORNE SUPPLIES

It is the vital task of the Navy in war-time to ensure the safe arrival of our seaborne supplies. If however, this Country could grow all the food we need, and if it could produce sufficient raw materials to keep its technical manpower fully employed—though not necessarily making all the materials required for a modern war (for it is becoming almost unthinkable that any single Country could be self-supporting in a world war)—this task might be appreciably eased. It might appear that, apart from importing a few critical materials, we would, in theory, not only survive for long periods but make our maximum contribution to a war effort. It is therefore worth considering whether scientifically speaking, such an outcome could be possible.

Productivity of food in this Country was very greatly raised in the late war and has been maintained at a high level ever since and is, I am informed, a case in which further increases can still be looked for. It is, I believe, even conceivable that in years to come this Country may approach self-sufficiency in food; but this may be only by the use of the most novel or revolutionary methods, that have in the end the trick of proving uneconomical, so that in my view, until it has been demonstrated by experiment that food production can be so raised and maintained over a long period, it would seem to be foolhardy to assume that any great alteration—one that would be more than a considerable relief to the naval task, will be achieved in this way. What is, however, evident is that in the field of defence here is a research problem of the highest importance.

Substitutes

Further, the need for cheapness and perhaps even more—sheer necessity, dictate our import of bulk raw materials. It is less certain that this must be generally maintained, because it is in the provision of substitutes in particular that the applied scientist is becoming so successful in his search for alternative or synthetic materials. Adding to what we could produce, with planning, some stock piles of a few so-called strategic materials, many of them in the form of elements, it is really surprising to find how few materials we really need to import, if some relaxation in performance could be tolerated; but unfortunately there appears to be two limits to such a development. The first is that there are certain materials with which we cannot do without and in very large quantities, and the outstanding one—oil may be a complete

example. Storage or stock piling may be a solution, but the expense may be very great. Proof by experiment would be needed before its worth could be assumed. The second limitation is the immense capital cost and the time that must elapse before this type of semi-self-sufficiency could be achieved. In Hitler's Germany, with the dual purpose of approaching such self-sufficiency and sustaining an unstable political system by artificial and uneconomic over-employment, considerable progress was actually made in this direction. Our task in this Country would be much more difficult, and one certainly hopes that the political conditions which would make it possible may never come about.

I do not consider therefore, that the tasks of naval strategy are essentially modified, nor do I think that the conditions in which the Navy operates are so affected by new weapons, atomic bombs or better aircraft, as are the conditions of the other two Services.

It is time now to try and relate these scientific observations to general strategy.

SCIENCE AND STRATEGY

The available ingredients for the recipe seemed to me, speaking rather generally, to be the following. There will be a limited number of weapons of enormous power, atomic bombs, present or future. There may be a threat of some form of biological warfare attack, the potentialities of which still cannot be defined, and indeed may not exist, but no prudent commander could dispense with all thought or precautions about it. Speeds, ranges and capacity of aircraft will all increase materially but perhaps without upsetting greatly the present rough parity between offence and defence; leaving the battle in the air still to be won before the great contribution of the air to the land forces can be made, and probably leaving but little over for the movement by air of any large bodies of troops or large equipment. At sea, one can again expect the fluctuations that we have experienced in two wars, in the battle between craft operating on the surface of the water and other types of craft operating above and below it. We can expect speedier and more accurate signal communications at all levels, with the consequent possibility, if it be desired, of permitting command in a strategic sense to be operated ever further from the field of battle itself. On land, if we are prepared to pay for it, we can expect developments in all types of equipment, especially perhaps anti-aircraft, which would at least keep the Army from deteriorating, but which is unlikely to alter dramatically its general role in securing and holding ground.

I think I should now state my concluding theses before I try to support them. They are :—

(*a*) The role of atomic weapons is at the moment becoming less foreseeable. It is conceivable that the advent of the super bomb might tend towards the neutralization of atomic attack.

(*b*) Strategic command will tend to be exercised nearer to the seat of Government, further from the battlefield. The Commander-in-Chief in the battle, who obviously retains a full measure of personal responsibility, will find balanced reconciliation of the Principles of War somewhat altered.

(*c*) The utilization of the Principles of War by governments will become more difficult and more necessary, as the different problems of civil morale, economic strength, allocation of manpower, and so on, become more operational and less a general secure background against which the Commander in the field can operate, knowing that all that was necessary for the maintenance of his forces was being done.

My first thesis—that of the possibility that atomic bombs, especially if the super bomb is developed, may not be used, is the most difficult to defend, and I think I am not so much trying to defend it as to offer it. The best operational experience in relation to it is Alfred Nobel's false belief that his improvements in high explosives were a benefit to peace, tending to make war too horrible to be conceived, rather than as an aid to war. I must reluctantly accept the proven falsehood of this deduction, rather than the superficially comforting contrary case that gas was not used in the late war, on account of its horror. I believe there were quite other reasons for this. I find no useful historical precedent—but then the atomic bomb itself has no precedent. Perhaps a shade more satisfactory are the two arguments that contestants are, at times, unwilling to embark on a form of warfare whose results are uncertain, and when they are uncertain of the ability of their enemy to retaliate in kind. This might apply to these bombs. And one could also argue that there is at least a philosophical conception that the more complicated and advanced weapons become, the more chance there is of their neutralizing each other, or of there being something in the nature of a defence against them. But the idea that all weapons bring in their train counter weapons may be a half truth; it is certainly not wholly true.

Finally, on this topic, even a scientist may be regarded as having some human feelings and some belief or hope in the ultimate sagacity of mankind, and it may be good that the Countries of the World should be brought to the realization of what the super bomb might mean—a task which some of the scientists here and in the United States are taking in hand. It may be a matter for regret that they must take the lead, and questionable whether they are the best qualified persons to do so.

Perhaps one can say with reasonable safety that a great Power that neglected from its defence preparations the power to retaliate in the atomic field would be defenceless in the long run, but that she might become equally defenceless if she relied solely or even mainly on this weapon to the serious detriment of supporting or more conventional arms.

APPLICATION OF THE PRINCIPLES OF WAR

It would surely be improper to give any lecture including strategy in its title without any reference to the Principles of War—the immutables, despite their surprising fluctuation in number from six to ten. But for the purposes of this lecture we will confine ourselves to :—

Selection and Maintenance of the Aim.
Maintenance of Morale.
Offensive Action.
Surprise.
Concentration of Force.
Co-operation.

Let us see, very shortly, how each in turn is varied in emphasis by modern scientific advances.

The Aim

Selection and maintenance of the aim is indeed little varied and remains as vital as ever it was both to the Commander in the field and the Commander of all the nation's resources; but its interpretation may become more difficult as it becomes increasingly compounded of the destruction of the enemy's material forces, or of his power to make war, or of the morale of his population. Its maintenance is, as always,

a matter for the tenacity of the Commander at home or in the field, subjected as he must more than ever be to internal influences. I have heard it said that, hard though it was to get the right decision taken, it was even harder to get it carried through. The complexity of modern war makes this all too probable. Thus if the principle is sensibly unaltered through modern scientific advances, and its detailed application in the field be ever present, its main force may rest more than before with the central government.

Maintenance of Morale

On the maintenance of morale, the task of the Commander in the field is doubled. He must not only secure the confidence and raise the spirits of his troops in the face of the greater hazards of modern weapons in the field, but he has an additional difficulty to counter, for which he must rely largely on help from home, through the fact that the home base of his troops is under attack. It is known that the morale of those away from the actual attack on their homes is more susceptible to such attack than that of those who actually suffer it.

I do not want to imply that morale becomes weaker as civilization progresses. Indeed, experience in the last war implies that the breaking point of civil morale is far higher than had been surmised, but, as communications improve and education spreads—and with it imagination—morale probably becomes more susceptible to sudden external changes. Thus the task of the Commander in the field is increased. As material resources become less certainly his to dispose, his need and power to raise the morale of his own forces to the highest possible pitch by his personal actions and successes become the more important. But equally the task of those at home in maintaining the security of the Home base becomes more important and more difficult.

Offensive Action

We get some variation, however, in considering offensive action. The need for it is no less, but the means of bringing it about may be less in the hands of the Commander in the field than in the hands of the Command at home. The allocation, for example, of air forces, or it may be of atomic bombs, must plainly be a very vital decision to be taken on the highest plane, and a Commander in the field might well be in the difficult situation of being crippled in his desire to take offensive action because, broadly speaking, his theatre is unimportant, his allocation small or unbalanced; so he may well have to study anew how to make the best attempt at offensive action with very limited resources.

Surprise

On the question of surprise, it seems to me, though here I know I can readily be challenged, that again the balance swings towards the high, or what for want of a better word, I can only call governmental command. The Commander in the field seems to be becoming ever more limited in his power to produce it, as modern aids to reconnaissance, photography of various types, radar, air observation and so on progress, mitigated but not removed by progress in the art of concealment, but the need for concentration for surprise does not decrease. Thus the classical forms of surprise, whether by strategem or the massing of significant masses of troops at unexpected points, should become more difficult. On the other hand, there are greater possibilities for surprise at the highest level as by seizing the technical initiative—as we did by the jamming of the German radar in the Hamburg raids, or by some important political observation, that may materially damage the morale of the

enemy, or significantly raise our own. One has, too, the surprise that can be obtained by unleashing the major weapons of the types I have discussed. Surprise then is a Principle of War very much applicable to a central command.

Concentration of Force

Concentration of force, embodying the art of strategy as it does, is definitely more certain to be provided from the highest level than in the field. No power yet has ever been so concentrated (and this includes concentration in both time and space) as the first atomic bomb. The super bomb would be even more concentrated. Biological warfare appears, in theory, to offer possibilities of concentration of force in small volume which on release may injure a very large area—perhaps the ideal form of concentration. Or, if we are less preoccupied with modern weapons, general improvement in sea movement and, to a lesser degree, air movement, have given a central command much greater opportunities to achieve concentration at sea, on land or in the air, than ever before. The lot of the field commander, especially if he commands land forces, has not been comparably improved. He needs a real increase in mobility, yet curiously enough except in isolated instances, the internal combustion engine has not in general produced greater overall mobility. I recognize that examples can be quoted against me in this matter—the initial thrust by the Germans through France; some of their exploits in the early stages of the Polish or Russian campaigns; some of the attacks of our own Commanders in the desert; or by the drive of the Guards Armoured Division into Brussels. But these were generally the fruits of a slow and difficult concentration being garnered after the defence broke or when it had been imperfect. The stretched elastic string that holds back any advance becomes stronger in its pull the more highly mechanized the force.

Co-operation

Never has co-operation between all arms been needed more. We had the striking example of the use of air power in co-operation with the land and sea forces in the late war. It is necessary to remember how hard this was to achieve, and the painful stages of obtaining air superiority or supremacy before it could be used; but the dividends were prodigious. They will still be obtained by the superior Commander in the field who has units from all Services to exploit, but the proper allocation of these may be done largely at governmental level.

THE EXERCISE OF COMMAND

I seem, therefore, to be tending towards the alarming conclusion that the Commander-in-Chief in the future will be based in Whitehall and therefore subject to many external influences from which a Commander-in-Chief should be insulated. I am afraid that I do think that there is a good deal of substance in this conception, and it is not made less likely by the rapid improvement in communications of all types—bodily by air, orally by radio, which enable the facts to be brought so quickly to the centre. It does seem to me that modern trends are bringing us nearer to the situation of Napoleon or Alexander the Great, who were at once Commander-in-Chief and Head of the State. There is one immense factor to which this is subject and that is, again, the question of morale in the field. No scientific means will ever remove the need for one man to be able to influence the morale of his army. Everything must be done to subvent this, nothing to undermine it. The Commander in the field who is known to be impotent without reference back in a major decision has his position undermined. This is perhaps the biggest foreseeable danger if the centralized control that I envisage occurs.

I conclude, then, with a short reference to my third thesis which, as you will remember, stressed the immense complexity of the task of command of those at the centre, and a brief consideration of how they can be helped to exercise it efficiently.

Total war demands the proper deployment of all forms of national resources and balanced income and expenditure in every commodity that is used. I include under these headings the formed units of the armed forces; their constituents—men and women, arms, ammunition and equipment; the whole production capacity of the Country, including its internally available raw materials and its manpower—technical and unskilled; the morale of the Country, forcefully directed to victory, or capable of sustaining private and public reverses; the health and nutrition of the Country; the management of its external resources within our own immediate control, e.g. merchant navies or certain overseas investments; the utilization of the contributions made by our dependencies or Commonwealth partners overseas; relations with our Allies and neutral Powers; and, of course, the catalogue could be further extended.

All these commodities are expendable. There is a natural rate of loss and gain in some of them, e.g. manpower and home-grown food; but the rate of use of some is greatly altered by war, and special means may have to be taken to economize in use or to increase supply. They are, also, far from being expressable in any single set of units. Probably the largest number can most nearly be expressed in terms of the national currency of the Country; but such numerical aids break down in a number of cases, particularly in the case of morale and skilled manpower.

We can claim, however, that in this Country we have made appreciable strides towards the formulation of a system of centralized control and command, based on the practices of a free people, characteristic of this Country's general talent for natural development in constitutional matters. The question is whether the process of natural growth and the rebuilding in any future war of the very considerable remains of the system that was used in the last one will, by itself, provide the necessary answer; or whether some more specific steps towards this end should be taken.

I think it is here that, once again, we meet the conception of strategy as an art. If it were a science or something, like chess, midway between the two, I would be inclined to say that theoretically at least a balance sheet for total war, forecasting the gains and losses derived from any decision, should be capable of preparation; from which the central command could take almost inevitable decisions. In this, a great deal of scientific aid would be needed, and would be as certainly forthcoming as I believe it would be acceptable, in spite of the fact that some of the ponderables are difficult or impossible to express numerically. But I do not see how science is ever going to aid a great deal in this task of prediction, without which the complete balance sheet is unthinkable. It is this belief that makes it certain to my mind that strategy will always remain an art, in which the great artists provide a performance based necessarily on excellent technique, but distinguished by their genius. There is nothing that we can do about furnishing geniuses. This Country has mercifully never lacked them: but science knows no way of breeding them. There may be a great deal that can be done about providing them with excellent technique. Such institutions as the Imperial Defence College are admirable as training grounds. The central command must be furnished with every form of calculating and forecasting device known. I include amongst such devices economists, statisticians, scientists and calculating machines. They must have access to all forms of expert knowledge, through men who are themselves expert in the fields, and who have had some practice

in expressing their expert knowledge in terms which show the executives, who must take decisions, which part is entirely reliable and which part is uncertain, in language that can be easily understood. This may be another of the innumerable descriptions of Operational Research; and it is clear to me that Operational Research has a considerable contribution to make. It may be one of the ways in which "present science" will particularly assist "future strategy."

If, therefore, I have alarmed you by suggesting that the seat of strategy will move nearer to the seat of government, I have not merely avoided the second blow that might have been coming, namely the suggestion that the scientists should take control. I have, I hope, parried it on your behalf. I think the scientists have a contribution to make, and I think that with this you will agree, but I see less rather than more reason why scientists should be active participants in our central command, than those trained in other walks of life, say the classics, law or politics. All I would say on behalf of the scientists is that while I believe one can do without representatives from any other single field, one cannot do without a scientific contribution at a high level. There are too many big decisions to take that involve some scientific knowledge. It is a great encouragement to people like myself, to find how far we travelled in this direction in the late war, and how very considerably these gains are, in peace, being maintained.

It is time to conclude. As you have seen, even in the middle of the XXth Century, it is very difficult to be both clever and original about strategy. But I hope I have been able to put some facts, some speculations, and some ideas before you that may have interested you. Let me end with a quotation of a literary criticism. Returning his essay to a student, "Sir" said Professor George Saintsbury—as great an authority on English literature as he was on wine, "your essay is both clever and original; unfortunately the parts which are clever are not original, and the parts which are original are not clever."

DISCUSSION

LIEUT.-GENERAL SIR GIFFARD MARTEL: I do not feel at all refreshed by what our Lecturer has said to-day, and I shall go away with the feeling that there is no form of defence against the atom bomb. I disagree entirely that the "Ministry of Defence" is a good name as it ought to be the "Ministry of Offence." What we ought to do is to see which nation can possibly threaten us at the moment with this terrible world warfare, and at the present moment there is Russia. We have done our best to go to Russia and say "Let us have international inspection" and so forth, but she will not play. When a Country will not play you have to turn to offence, although not in a shooting war but rather in cold warfare.

We and America could do that with the utmost ease in the case of Russia and make it impossible for her to remain in Europe, as I explained in this Hall three weeks ago. We could lose her such prestige that the Communist party would collapse. The only way to get security in the World is to turn cold warfare on her so that the autocracy which is highly unpopular there falls to the ground. Any other form of defence leaves me quite cold at the moment.

THE CHAIRMAN: I should like to encourage that line of thought. There is a new element of strategy which has never been thought of before, I think, on a large scale and that is the cold war strategy before anybody gets to a hot war. Could any military historian here tell me whether that position has ever arisen in history?

LIEUT.-GENERAL SIR GIFFARD MARTEL: I cannot tell you that, but neither has the atom bomb ever arisen before in history.

THE LECTURER: I referred in my lecture to the possibilities of psychology which, I suggested, are far from exhausted. At the moment we know uncommonly little about it. Quite possibly it is right at the bottom of the growth curve.

LIEUT.-GENERAL SIR GIFFARD MARTEL: I should like to suggest that it is halfway up the curve already, because Russia has succeeded in capturing half of Europe, China and so on. If that is not halfway up the curve I do not know what is!

CAPTAIN E. ALTHAM, R.N.: May I follow that up with the suggestion that we should view this vital subject of scientific developments and strategy as falling into two categories. First of all there is a category which might be termed political strategy, and which primarily relates to peace. Secondly, there is military strategy which essentially relates to war. Surely, in so far as scientific development applies to political strategy in peace, the greater the "bogey bogey," let me call it, that can be built up by scientists and politicians with a view to making war so fiercesome that peace will be preserved, the better?

But when we come to what perhaps more particularly concerns us here—the military aspects of scientific development, I suggest that we must couple the scientists in some measure with military necessities. To begin with we require their full co-operation in measures for the defence of this home base of ours and of the regular deliveries of supplies to it. Those measures must be a first charge on our limited peace-time resources. When they are assured—and only then, we can start thinking ahead to the next stage in our military strategy—offence. Here, I suggest, we have to be a bit careful how we adopt great new powerful weapons because, surely, the ultimate object of war is to secure the most satisfactory —or at any rate, the least unsatisfactory, peace possible. We have had a very clear demonstration as a result of the last two wars of how darned unsatisfactory peace can be!

One of the things which, undoubtedly, tends to produce an unsatisfactory peace, is the unrestricted use of weapons of obliteration. Surely offensive weapons should be used primarily for that softening up process which is the essential preliminary to what I will call the "occupation" process. Is not strategy governed by the simple fact that you have not finally won a great war until your occupation forces are controlling the enemy's Country, or at least, his government or whatever authority may be maintaining his resistance. If we use those obliterating weapons in any other way, we are not concentrating on the real object in war; moreover we are probably laying the foundations of a most unsatisfactory peace.

Therefore, I do suggest that the scientists and the Services should get together and analyze carefully what scientific developments of weapons will conform to those fundamental Principles.

One other point: the Lecturer has suggested that the strategy of a future war will be directed more and more from Whitehall. I suggest that perhaps Washington will also have a say in it!

THE LECTURER: There are Whitehalls in both capitals!

MAJOR G. C. MEARES: If the H-bomb is absolute in its effects, particularly on the centralized machinery of command, to what extent is any conflict on a world scale likely to be practicable as an instrument of policy by any government to attain its end, since there seems to be almost an equal likelihood of both governments within a very short time being destroyed and the conflict degenerating into an anarchical civil war over a very wide area?

THE LECTURER: Really you are following on the same philosophical argument that if the super bombs became available to both sides, there would be a greater chance of their not being used than if the conventional atomic bombs were available to one side and possibly to both.

At first sight the super bomb looks like an absolute weapon, but it is too early to say

that it is so for certain, and I would not advise anybody to be optimistic about it being made or, if it is, about there being any means of defence against it. It is for us a matter for speculation.

MAJOR F. G. HEARD: We have had discussions on bigger and better atomic weapons, but is there any possibility of smaller and handier ones!

THE LECTURER: Yes, but not much smaller and not much handier!

LIEUT.-GENERAL R. N. GALE: There is one point that has obviously struck everybody in this room, and that is the immense power of this super bomb; but I think that there is even a greater power, namely, the power of man. The biggest single factor in life is personality, and the biggest single factor throughout history has been the influence of one or more personalities. We need not go over their names—they are all very well-known; but I should say that the greatest safeguard, and the thing that we want to study more, develop more and think of more is this influence on human nature as exemplified by the personality of one, two or three or even a number of great men. If we pin our faith on that and study it, I think we shall go a long way to beating these horrors.

THE LECTURER: I rather dislike the idea of a school for geniuses; but I do like the idea of a Country such as this in which they grow.

GROUP CAPTAIN G. C. BARRETT, R.A.F.: The Lecturer has suggested that the conduct of a future war might be centralized in Whitehall. Some may think that if that is so we might as well give up now! I think in some ways it is a dangerous thesis, because, as the Lecturer has pointed out, if the Commander-in-Chief is going to be in Whitehall, he will be subjected to endless outside pressure which will take his mind off his aim. We ought to use the facilities which science can provide to get him away from Whitehall, because there is even now evidence of more centralized control with the result that more and more people, who should be taking decisions of their own, are waiting for other people to make up their minds for them, and are thereby losing their sense of initiative and responsibility.

While it may be a true interpretation of fact that we are tending to centralize control in Whitehall, it seems that we should make a firm stand and decentralize so that the Commander-in-Chief can live away from Whitehall; otherwise, in time of war we shall not possess men of imagination and initiative to use the weapon which the scientists are creating because, in time of peace, we have permitted conditions which suppress them.

THE CHAIRMAN

One of the difficulties about the advance of science is that it tends to centralize a position too much, and I agree with Group Captain Barrett that those who have the great final responsibility ought seriously to consider how much they can devolve and not how much they can centralize. What would have happened in the Napoleonic wars if Nelson had been in close touch with Whitehall at the time?

What we are studying are the effects of science upon strategy, and I want to get some of my friends from each of the Services to tell me what is strategy and what is tactics, because we get confused between them. We have heard a bit to-day about the effects of surprise, and I have always accepted from Kipling that the essence of strategy is forethought and the essence of tactics is surprise. Whether it has changed or not, I do not know.

If you consider the really fundamental strategy, then the root of it still remains and science makes no difference to it at all. The fundamental strategy of the blockade, for instance, and that of preserving our own sea communications. Science has made no difference to those chief matters of strategy, but it has made a difference to their relative importance. In the old days blockade was a very slow weapon; in fact, in the time of Napoleon it was a very slow weapon indeed. In the late war it was also a much slower weapon than a lot of people thought. We can say that about it on either side. The question is whether it will still be a slow weapon. I think that there is a chance, owing to the advance of science—if you like to put it that way, of putting blockade into effect in the widest sense, that is to say, destroying an enemy's power to produce and destroying the

vitality of his Country because of food shortage. I think that the effects may be much quicker than they were in the past, and other strategies are affected.

Dr. Wansbrough-Jones said, quite rightly I think, that there was nothing in the development of aeronautics which he could see would make a big difference to strategy, but personally, I am not sure he was right in postponing the time by many years. It is quite impossible to-day, for instance, to rely on air transport for bringing into this Country large quantities of troops and military material during a war, for reasons into which I need not go. But I do not think that it is at all impossible that in ten years time, or perhaps nearer, there will be a change, and air transport will be of vital importance in a war rather than of secondary importance as it is now. That is a direction in which strategy may be altered.

Another remark I should like to make is this. You must admit that science has disposed of one thing of major strategical importance already, and that is the health of the armed forces. So far as we can see now, we need never fear that disease will be a matter of major importance in war; but the late war was the first one when it was not. It is true that in the 1914-18 War the men killed in battle were greater in number for the first time in history than those killed by disease, but there was the influenza campaign after that war which beat us and in which a greater number of people were killed by influenza than were killed in battle. In this last war that did not happen, and in future wars disease will sink into insignificance as a strategical matter unless nature hits back at us in some way which we do not foresee at present.

I thank Dr. Wansbrough-Jones very much on your behalf. The discussion has been extremely interesting to me, particularly from the point of view of the cold war. I think that wants more consideration. I think that he will agree that we do not yet see any clear method whereby the application of science might make a great difference to the decisions of politicians! (Applause.)

The vote of thanks to the Chairman was proposed by Lieut.-General R. N. Gale and carried by acclamation.

AIRCRAFT FOR ARMY USES

By Lieut.-General R. N. Gale, C.B., D.S.O., O.B.E., M.C.

On Wednesday, 1st February, 1950, at 3 p.m.

Air Marshal Sir Leslie Hollinghurst, K.C.B., K.B.E., D.F.C.,
in the Chair

The Chairman: It is my privilege to introduce to you, if introduction be necessary, our Lecturer this afternoon—General Gale.

I can think of no one more qualified to speak on the subject with which he is going to deal. As you probably all know, he was first Director of Air Strategy in 1942: after that he had, if possible, more experience in connection with the air when he became G.O.C. 6th Airborne Division, which he led with such distinction in Normandy and for some time after that. He now holds what is, particularly at the present time, a most responsible position as Director-General for Military Training at the War Office.

LECTURE

THE subject of my lecture is "Aircraft for Army Uses" and not "the Army's requirements of the air." I would have liked to have drawn a line between the two subjects, to erect a wall as it were, and to stick to one side of it. I would, like a child in the make-believe which forms so much of a child's life, prefer to pretend that such a wall exists, and then ignoring all considerations of resources and the air situation, to talk loudly of the aircraft which the Army requires for its own purposes. This ignoring the hard facts of life, this disdaining to consider such matters as the provision, the maintenance and the very possibility of such aircraft being able to fly at all would make my task so much the easier. I am afraid, however, that this handling of the subject would be quite profitless: for the one is far too greatly dependent on the other for such simple treatment. That is my first point.

MOBILITY

My second point is this. Mobility in the battlefield and in the theatre of land operations is essential to the soldier. It is the genius for exploiting mobility either tactically, strategically or administratively that so frequently in the past has won land battles or even whole land campaigns. The Duke of Marlborough surprised his opponents by the rapidity of his moves and, due to the difficulties of which the enemy was so fully aware, their unexpectedness. In more recent times, what was at first sight an apparently administratively impossible operation was accomplished in Burma. In that campaign it was a matter of most far reaching importance when the commander of the 14th Army decided to risk an advance by his Army without any sound land line of communications. He chose to rely implicitly on, and to exploit the whole possibility of, air supply; not for a mere handful of troops, but for a whole Army.

The mobility which air can give was exploited by the Germans when they seized by airborne landings the airfields in Holland, and the Maas bridges and the Belgian fort at Eben Email.

Extravagant though the German attack on Crete was, and naked as our defences were, the use of the air as a means of invasion contributed largely to their quick success. They began their preliminary preparations for this attack immediately on the termination of the Balkan campaign, the attack being launched on 20th May.

The airborne assault was launched from airfields at Dadion, Corinth, Topolia, Megara, Tanagra, Phaleron and Elusis. The Germans made no attempt to achieve surprise. Though the plan was to get a foothold simultaneously on three different points, the bulk of the German force was landed in the western part of the island at Maleme. Other landings were made at Retimo and Heraklion. In accordance with their usual conception of exploiting the soft spot, the success at Maleme was the one on which they built up. The almost complete lack of anti-aircraft defence and fighter cover made these operations possible; it would nevertheless have been *still* possible even had we been more firmly established at Crete; the preliminary softening process in these circumstances would only have been longer and more thorough.

It was the full exploitation of mobility which the free and courageous use of the air gave, that enabled the British 6th Airborne Division to seize, in a matter of a few hours, the high ground East of the River Orne. It will be recalled that the left flank of the British seaborne assault was bounded by the double water obstacle of the River Orne and the Canal du Caen. The ground to the East of the river flanked and overlooked most of the 1st British Corps' front. To have extended the seaborne landings to the beaches to the East of the Orne in order to capture this ground would have extended the front of the seaborne assault, increased the number of landing and other craft required and would, moreover, have come under the fire of the heavy gun defences of Le Havre. The river and the Canal were obstacles of no mean order and to have attacked this high ground from West of the Orne would have been a costly, uncertain and undoubtedly a slow proceeding. In fact the quickest, surest and simplest way of seizing this dominating ground was by means of an airborne assault. The ground which this division seized in a matter of hours between the Rivers Dives and Orne, the bridges over the former being all blown by the airborne troops, was some four to five miles in width and five to six miles in depth. It took at least two days of heavy fighting with enormous expenditure of effort, ammunition and life for the assault divisions West of the Orne to achieve the same results. This is no idle boast: it is a statement of fact.

The reason was the complete surprise which the airborne landings achieved, and the time honoured and well-known fact that a frontal assault, often essential and sometimes inevitable, is a costly and painful method of seizing ground.

The seizing of Eindhoven, Nijmegen and Arnhem by the 101st and 82nd United States and 1st British Airborne Divisions is another example of the free and courageous use of air as a medium for movement.

We must recognize that the ability to move soldiers, material or supplies by air is essential to any modern army. The problem is to what extent is this feasible in the light of the air situation at the time and the provision of the essential aircraft. I do not wish to gloss over or underestimate these difficulties; the counter draws of other and possibly more important requirements will always be there; nor do I wish to gloss over the whole problem of the air situation and all its attendant complications.

In regard to the counter draws, these are and must be matters for the Chiefs of Staff and the Defence Minister to decide. The whole problem of distribution of national effort in material and manpower is involved. One has only got to throw one's mind back to the grim days of the early 'forties to get the picture in perspective.

The second point which I wish to make is therefore this: mobility either in the tactical battle or the field of maintenance can be achieved to a greater or less degree by the use of aircraft.

SPEED

My third point concerns speed. There are in the conduct of land operations certain things which must be done speedily. Everyone of course wants to do everything as quickly as he can, so in this quest for speed as in so many other matters we have to concentrate on the essentials. In this connection I am thinking now in terms of the speed of movement of individuals and in particular those whose slower movement must at all costs be avoided. The whole control and consequent battle efficiency of an Army is simplified if Commanders, and important staff or liaison officers, can be moved quickly from place to place on the battlefield. Such people must go forward to see for themselves what is happening: they must be able to visit neighbouring formations and armies and they must be able to attend conferences in the rear, which by their nature cannot be held in more forward areas.

I have recently returned from Malaya, and there visited General Boucher at Kuala Lumpur. I found that the only possible way of visiting the various places I wished to see in the time available was by using an Auster. A little over half an hour's flight in an Auster avoided over three hours motoring, and that with an escort. Because of the hours of darkness and the state of the jungle roads I should have had to take two days to do what was easily possible in one. The Auster is freely used in Malaya by the General and his Senior Commanders. Indeed the difficulties and problems with which he is confronted now would be immeasurably heightened were this means of transport withdrawn.

In the Rhine Crossing I was able to fly forward from General Ridgeway's Headquarters to the 6th British and 17th United States Airborne Divisions and back before our bridges were properly going over the river. The number of occasions on which the first air observation squadron in North Africa was used to ferry important officers about were legion. This misuse, as technically it might well be called, was continuous because it was essential: because it saved time; because time saved in war is an asset and time wasted is a hostage to the enemy.

In this realm of speedy movement we have, too, to consider the seriously wounded. Movement by air enables such casualties to be got back to hospitals rapidly, where the alternative move by road over long distances, or by stretcher along narrow and tortuous jungle paths, might well be fatal to the casualty. The third point which I wish to make is that the fast tactical air courier service or intercommunications service in the battle area, as well as the removal of serious casualties from the forward areas by the same means is a requisite.

OBSERVATION

The fourth point I wish to make is that in spite of all mechanical contrivances and scientific aid of radar, sound location and predicted shooting, artillery fire to be accurate must be observed by the human eye. Such observation as is required for the shooting of guns can only be provided from the air. This has of course been long recognized.

In the past the problem was overcome by the observation balloon. Many of us can well remember how in the 1914–18 War the advent of numbers of German balloons in an area was always a prelude to some distinctly uncomfortable shelling. In March, 1918, the Germans in their advance always got their observation balloons well up.

In the late war the mere appearance of our Austers would often silence German artillery; indeed on one famous occasion in Italy a constant Auster patrol was

ordered so as to keep German artillery quiet with, we now know, surprisingly satisfactory results.

The requirement for this type of aircraft is established.

ARMY REQUIREMENTS

Now from what I have said you will see that there are in fact three main purposes for which the Army requires aircraft, for what I might call its own particular needs. These are :—

(*a*) Troop, equipment and store carrying aircraft, capable of delivering their load in the battle area when it is required, and as a corollary by aircraft not dependent on airfields at the delivery end of this service.

(*b*) Inter-communication aircraft capable of taking off and landing on very restricted areas in the battle area and preferably independent of airfields or airstrips of any sort.

(*c*) Air observation posts capable of hovering whilst observations of fire are being made, which are not dependent on airfields or airstrips for both take-off and landing.

Transport Aircraft

I should like now to enlarge a little on both the necessity for and the types of aircraft which we soldiers think we require for each purpose. I shall deal first with aircraft for what are generally called airborne operations. I think in this field there is a certain misunderstanding as to what the Army means when it talks of airborne operations. In this matter, as in so many others, peoples' minds are most influenced by their most recent experiences, forgetful of the conditions in which these experiences were gained. The general attitude towards airborne operations tends consequently to be influenced by the air situation that existed at the time of the Normandy landings, and following on this the enormous scale on which those and subsequent airborne operations were planned and executed.

There cannot surely be even in the most unbalanced mind, any thought that at the outset of a campaign operations *of this type* can be contemplated. At the same time, there is to my mind no doubt that the air *as an area of manœuvre* can and should be exploited, even in conditions such as might exist in the early days of another war. It is merely a matter of perspective.

For example, it has been said mastery of the air and command of the sea must first be obtained if large scale offensive operations are to be undertaken. No-one can dispute the fact that against a first-class enemy to win the land battle before the air battle has been won is most improbable, nor that to have to conduct a land battle when one's opponent has mastery of the air is to have to fight under the most appallingly adverse conditions. On the other hand, the commencement of a war by an aggressor Power places the attacked nations initially on the defensive and at a certain disadvantage in terms of time and space. A major defensive land campaign may then be forced on them before the air war, or the sea war for that matter, has been won. The air, land and sea battles may, in fact, have to be fought simultaneously. We must, therefore, recognize the hard fact that land battles, however bloody the consequences, can and will have to be fought in such conditions. The disasters of 1940 were *contributed* to by the air superiority the Germans at that time possessed ; but that air superiority was not the one and only decisive factor : there were others.

It is a fact that Von Rundstedt dropped German parachutists in connection with the Ardennes offensive in 1944. It is true that these parachutists had little or no effect on the battle; but it is equally true that they were dropped, *by a nation* which at that time, had not only lost their mastery of the air, but had quite definitely lost the air war. The fact that the plan was haphazard, as it undoubtedly was, and that the parachutists were dropped wide, indicates nothing more than bad planning. It does show, on the other hand, that such operations, unambitious in the number of troops and consequent air effort involved, are indeed feasible even when air superiority is not theirs.

In February, 1942, a British airborne operation was carried out by a company of the 2nd Battalion of the 1st Parachute Brigade. This was a raid, the object of which was to get into a German Radar Station on the North coast of France at Bruneval and to seize certain of the equipment of the station. The raid was carried out at night. It completely surprised the Germans and was an unqualified success. We certainly had not won the air war then, although we had won the Battle of Britain.

I have quoted these examples to you to show that in fact the judicious use of the air to transport troops, or for that matter supplies, in the battle area, is a feasible project even when the air war has not been won, and one which we must not just rule out as wishful and dangerous thinking.

The types of operations of which I have spoken involve what for want of a better term I might call the jettisoning of the cargoes. There is one aspect of this type of work which I think merits great attention. It is the factor of accuracy in navigation. Failure in this aspect was I think most noticeable in the Sicily operations and was attributable to two main factors—firstly the lack of training of pilots in this work, and secondly to the failure to adopt the use of any homing device which up to then we had considered advisable but had not yet used on operations. There may have been very good reasons for this, but I think it was a pity. The Royal Air Force and particularly 38 Group took these lessons very seriously to heart, and training was intensified and equipment installed in aircraft in that group. The following incident in 1945 will show how far we had advanced.

On the night of 4th/5th April, 1945, Operation Amherst took place. In this Special Air Service troops were to drop in ten different parties in Holland. This drop was carried out by the 2nd and 3rd French Parachute Battalions, S.A.S. They were dropped in the area South of Groningen, when the leading units of the 2nd Canadian Corps were still some miles from that area. In the words of General Simonds, who commanded the Canadian Corps, which I now quote verbatim, " They made a real contribution to the advance of the 2nd Canadian Corps in that area. In addition to their killing and capturing a number of Germans and preventing the destruction of certain bridges, their activities caused considerable confusion and consequent change of plan by the local German commanders. Also it was largely due to their help that we were able to capture the airfield at Steenwijz intact. If there should be an occasion for the employment of such units on our front in future, I would welcome the selection of the 2nd and 3rd French Parachute Battalions for the task." A pretty compliment and well-deserved by our French Allies.

But my point in mentioning this to you is that on the afternoon of the 4th April, the late Air Vice-Marshal Scarlet-Streatfield, who was then commanding 38 Group, rang me up to say that the weather conditions were most worrying. He said that we could expect as much as 10/10th cloud over the area at the time of the drop.

But he said it happened to be at a very good point for G intersection. He could, therefore, be fairly sure of dropping them through cloud, but not accurately. He estimated the inaccuracy would be in the order of two miles off target in one direction and one mile across. I said I was prepared to accept this degree of inaccuracy in view of the task and the general situation at that time. So the drop took place. All the parties were dropped well within these limits and all reached their allotted objectives. This may be taken as an isolated case, but it showed me quite clearly that something of this type of thing could be done. It opens up most important aspects of this whole problem.

I need not enlarge on this aspect of accuracy, because you can all imagine the frustration and disheartening effects on both troops and their commanders of inaccurate location of dropping zones. The results are fatal and waste of both life and effort. Only those who have had experience of loading and unloading aircraft containing awkward loads such as jeeps, guns and the like, can know the frustration and real exasperation, as well as loss of time, which this part of air transport work can produce. Ease of loading and unloading are requisites of modern transport aircraft that occupy a high priority in our requirements. We stipulate in all our General Staff specifications for our own equipment that it must be designed to facilitate the ease of loading and unloading in aircraft. We require that in the design of transport aircraft this aspect should be part of the air specification.

Finally in this respect we want aircraft to be capable of landing in forward areas on small airstrips. Here we realize we are up against real air design problems of the first magnitude. Nevertheless, as the lift of transport aircraft improves, so their power goes up and so the length and strength of their concrete runways increase; and so in consequence the opportunities for their use where and when they are wanted diminish. Arrester devices, mattresses for landing or any development of this kind to enable the heavily laden aircraft to land in comparatively confined spaces is what we want.

Now to tie this up to our actual requirements. We want a number of transport aircraft capable of dropping parachutists in such a way that the stick or line of parachutists on the ground is as short as possible. This can be achieved by throttling down to a slow turn of speed and by jumping simultaneously from doors on either side of the aircraft. The matter of low speed when dropping and of easy and quick facilities for exit of parachutists are to my mind fundamental. Ease of loading and unloading is essential, and aircraft must be capable of landing on forward airfields or strips of comparatively small dimensions. I further consider that transport aircraft should be fitted with navigational devices that will ensure to the greatest extent scientifically possible accurate navigation.

Gliders

When a parachute force lands it requires certain heavy kit to enable it to hold the ground it has seized. It must be able to withstand the immediate counter-attack by armour, and for this it requires anti-tank weapons; and it requires high powered wireless sets fitted into vehicles, to quote but two of the many examples of heavy equipment which cannot accurately be landed by parachute.

We all know now that, however good the aircraft crew and however skilled the parachutists, a "stick" of parachutists undoubtedly covers a considerable area: under operational conditions twenty men will cover an area of not much under one thousand yards. Immediate, and by this I mean instantaneous, surprise assault on a point cannot be achieved by troops who are so dispersed. The glider is still the

most accurate way of putting a platoon of soldiers with all their equipment together, concentrated on one spot.

Now as to the types of gliders. The type of glider will vary with the load between the Horsa, a twenty-five seater with an approximately 6,000 lb. pay load, and the Hamilcar which is capable of landing a 17 pdr. anti-tank gun with its towing vehicle, having a pay load of approximately 7½ tons. The necessity for the glider as we know it to-day will of course disappear when something comes that can replace it, but two requisites are essential. The first is pay load and the second is extreme accuracy of landing. We know that even under conditions of night, gliders can be accurately landed within a yard or two of their appointed place. This is indeed an asset which we must not give up.

Inter-Communication Aircraft

For inter-communication we require an aircraft that can land and take off in the forward areas and on airstrips which soldiers can prepare fairly quickly and without resort to the use of heavy equipment. We want an aircraft with a rapid rate of climb and a low landing speed. We do not want a big pay load, for as the pay load goes up so will the length of strip for take off and landing increase. We want to work back from this as the matter of first priority.

We do not know, and indeed cannot know, the precise aeronautical design problems that our requirement will produce. It seems to us, however, that an aircraft of the Helicopter type is ideal for these purposes, for such an aircraft can virtually land wherever it is wanted to and take off from the same spot. The Helicopter may, and indeed probably has, a good long way to go before it is aerodynamically as good as it might be; but we have seen this type at demonstrations, in use in the Post Office and in the United States, and we are convinced that for us it has a future.

The getting back of casualties from the forward areas demands much the same characteristics as those of the inter-communication aircraft. It is, in fact, only the problem of fitting in a stretcher: for here again it is the ability to get down and get up from small fields, or a clearance in the jungle and other types of enclosed country in the forward areas that is the main consideration.

Aircraft for Air Observation

For air observation we want an aircraft capable of landing and taking off from short strips in the gun line areas, of flying slowly behind our own front line with excellent facilities for observation, not only of the target at whatever angle or position the aircraft is in, but also above and in the rear, so that the pilot can see any hostile aircraft which might be of danger to him. We want a certain endurance in time, and to carry a wireless set in addition to the pilot-cum-observer, or alternatively one passenger.

And here I must make it clear that in specifying the aircraft in detail, I am speaking to you of what we want if we can get it. We know why we want it and what we want it to do; it must however be to the Air Staff and to the Ministry of Supply that we turn for advice as to the most suitable craft for our purposes.

If I might digress here for a few moments, I will tell you of our experiences in the adoption of the Auster aircraft for our Air Observation Post requirements. I can speak of this matter from first hand knowledge, as I was at the time Director of Air myself in the War Office. The General Staff had quite correctly stipulated their requirements in the form of a specification. This specification gave such details as the lift, a pilot and one other passenger or alternatively a wireless set; a take off and

lift of so many feet in so many yards and ability to land in a field of certain dimensions; good observation all round; and a certain power of endurance. Without going into all these details suffice it to say that our figures were all accepted as being practicable by the Air Staff. The American Stinson was considered to fulfil these requirements, and so three were ordered for experimental purposes and were duly despatched to this Country. They were, however, sent over in a store ship carrying provisions and placed in the hold under several hundred tons of cheese. The aircraft were crushed to death, if such a thing can happen to aircraft, or gassed by the smell of the cheese: whatever it was they were useless when they arrived at this end of their journey.

The Air Staff then offered the Army what they considered to be an excellent aircraft: it was a Taylorcraft fitted with a Cirrus engine. I can, with confidence, say that the users just hated this solution. They wanted the Stinson, but if they could not have it, they wanted another aircraft which shall be nameless. I went personally to the late Air Marshal Linnell, who was then at the Ministry of Aircraft Production, and put our case before him, and I asked him for his advice and help. He asked for time to consider the whole thing and eventually he called a meeting and the matter was settled. From the Air Staff point of view the Army had not tried the Taylorcraft sufficiently to justify their major criticism. Some of the faults were admitted, but these could be rectified. The aircraft was underpowered, so Lycoming engines were ordered from the States, and in the mean time Gipsys were to succeed the Cirrus. The roof was to be altered and perspex was incorporated to give better vision. I myself, having accepted these changes, as well as the Auster which it was to be called, came under the heaviest fire from my old friends in the Royal Artillery.

I think the facts and history speak for themselves, for if there is a success we can claim in the last war, it is the Auster. To-day in Malaya it is just worth its weight in gold, though the purist might question what he would call its misuse for inter-communication purposes.

USE OF LIGHT AIRCRAFT

The possibility of such aircraft as I have mentioned for the Air Observation Post squadron or for inter-communication purposes, ever being able to keep in the air under conditions when we have not control of the air is, of course, of great importance. Here experience is by no means conclusive evidence.

However in North Africa the Auster I. was used and not one—I think I am correct in saying—was shot down although we certainly did not have superiority in the air in the early days of that campaign. Talking to pilots of these aircraft I was left with the impression that the German fighters just did not see them. The modern fighter cruising at the pace it does is likely to miss a small aircraft flying at hedge height, at probably 60 miles per hour. Such an aircraft too has a manœuvrability which will probably outwit the fighter. I must say theory and practice are two different things. I freely admit I wonder very much what my own feelings would be if I saw a flight of fighters coming up behind me. I once had such an experience and was only too relieved to find that my recognition of aircraft was at fault.

THE FUTURE

I have refrained so far in this lecture from any mention of future developments; not because I do not consider these of the greatest importance, but because the problem

is one for the real experts in aircraft design and development. I do, however, advocate the necessity for study of future development most seriously. In the realm of airborne operations, for instance, I would be the first to welcome the end of the glider; tied as it is by a piece of cord to a tug aircraft, it is a most unscientific and clumsy adaptation. The dropping of individual men by parachute is a most elementary method of getting men to the ground—unsafe and, as experience has shown, often wasteful. One looks to-day to the container with its cluster of parachutes, but even this seems to me to be full of frightening potentialities if applied to the landing of human beings: in so far as loads are concerned and personnel for "coup de main" parties and the like, this method cannot have the accuracy which the man controlled glider has shown that it is capable of. At the end of the War we were developing delayed-dropping technique, which we hoped would give both accuracy and safety for the aircraft concerned. Greater lifts are desirable and possible now in our great civil transport aircraft. Can we adopt this great lifting capacity so that for landing its loads at least it will not require a mile or more of concrete runway? I have referred already to the development of technique for landing heavily laden aircraft in small spaces, and their take-off unladen being possibly assisted by artificial means, from the same places. Heavier weight-lifting helicopters may emerge, and if aerodynamically practicable, should be developed.

SUMMARY

The Army wants transport aircraft capable of operating from forward airfields, able to take really heavy loads of troops and equipment either to jettison or land them on forward airstrips, easy to load and unload, and capable of really accurate navigation. We hope for a really good load-carrying Helicopter, but realize this has many problems as yet unsolved.

The Army also wants inter-communication aircraft for courier work in its most forward areas, independent of airfields and if possible even of air strips.

It wants light air ambulances, and finally it wants Air Observation Post aircraft having the same potentialities of take-off and landing as the inter-communication aircraft.

DISCUSSION

MAJOR JOHN NORTH: I think the Lecturer is still thinking in terms of the infantry battle. I wonder if he would agree with the Americans that there are possibilities for the airborne Armoured Division as such?

THE LECTURER: A most difficult problem that faces any Commander in the Army is to relate past experience to future development. Sooner or later, the battle has got to be fought, and the question that he must keep ever before his eyes is what are the circumstances of this battle going to be? Now, he has got two things to work from—and this is very important—the first is the accurate assessment of the potential of the enemy; in that potential there are two factors: one is equipment—what equipment is the enemy able and likely, conceivably, to possess. The other is the psychology of the enemy; what is it likely to lead to? Following on these, he has to develop his own equipment and tactical set-up. He cannot take the offensive first because he is British; if he were an aggressor of another nation, he would start first, because he would have been planning, equipping and training for a war which he intended to develop at a time of his own choosing. But he is not an aggressor, so to that extent, he loses the initiative; to that extent he has to consider first what his opponent will have, and what he is likely to do.

The next thing he has to consider is how he can counter it. There are two ways of looking at this problem from the point of view of equipment—equipment I mean in its widest sense. One is to face resolutely up to the facts of life, and to realize what we, our Allies, and the scientists can produce in the time available, and that possibly is the most sobering of all thoughts. The second thing which he has to think of is, having realized what are the facts of life, how he can utilise them to the best advantage ?

These are two factors which impose the greatest limitations to the activities of armour—ground and the anti-tank gun. Given ground which is unsuitable for the manoeuvring of tanks, and given well-concealed, skilfully sited, resolutely handled, a weapon which is capable of knocking out that tank, the punch goes out of armour. So that in this realm of airborne movement, rather would I be inclined to move by air a spout weighing a matter of pounds but being able to discharge a shell or projectile having the most lethal effect against the heaviest armour, than the vehicle itself.

When you get down to the realms of possibility, and realize that the modern tank—whether ours or any other—weighs a matter of 50–60 tons, you may wonder, is that a feasible landing proposition ?

I do not know much about tyre pressure or track pressure, or the number of feet of thickness of concrete necessary to take the load of a heavy freight carrier when it lands, but it is pretty stupendous.

I would say in answer to your question that one of our advances ought to be in the field of metallurgy, so that we can use the lightest material in weight to produce the hardest hitting and most accurate weapon.

LIEUT.-COLONEL H. T. MOLLOY : Is there any scope for airborne troops in the jungles of Malaya ?

THE LECTURER : The French have used airborne troops to a certain extent in French Indo-China, but I do not know to what extent they have been successful ; but I do believe that the ability to place by air a few men of the right type, correctly equipped, and at the right time, behind an enemy of any sort, is a great asset, and one which is worth exploiting.

I would say, from the little I know of Malaya, that it may be a matter of practical application which has prevented the use of airborne troops up to now ; but in theory, the employment of a few men dropped behind what is believed to be a safe locality is a serious threat to an enemy's security.

LIEUT.-COLONEL H. T. MOLLOY : Do you know if they are training Ghurkas for that work ?

THE LECTURER : They trained Ghurkas during the War, and I believe they are excellent parachutists, but I do not think they are training them at the moment.

GROUP CAPTAIN G. C. BARRETT, R.A.F. : Might I question the interpretation which you put on " air superiority " in referring to the two operations—the Ardennes and Bruneval, in which airborne troops were dropped in the face of an adverse air situation. Air superiority is an uncertain thing—somewhat intangible. It is not difficult to achieve air superiority for a short time almost anywhere if you set out to get it by concentration, by surprise, or in a variety of other ways. But I suggest the lesson you drew is a little dangerous, because we never had time, in either operation, to see whether the air situation was going to affect the whole situation : the operations did not last long enough. If we had landed at Bruneval with the object of keeping a force there, it would not have worked. In the face of an adverse air situation an airborne landing is not an operation of war on anything more than a very small local scale.

As an airman, I am inclined to oppose airborne forces because they are a special force, trained for a special job. When their training is completed, they are held on the ground until we in the Air Force can create a situation in which they can be used. There is always this psychological pressure on us to try and get them into the battle. I have

had the impression more than once that, in the late war, there was a tendency to force us to create a situation, and then to deliver the airborne troops—not always in the best circumstances, because they feel they are being kept out of something they want to be in. It raises some doubt in my mind whether the creation of an airborne force for that purpose is really economic, and whether the right answer is not to go for general air mobility of the Army as a whole, rather than the creation of airborne forces as a special effort.

THE LECTURER: I welcome the opportunity to talk on that subject for a moment. If I gave the impression that by these short affairs, such as the Bruneval raid, I thought maintenance of an airborne team was possible, I wish to kill that at once. My own experience, and indeed the reading of battle goes to show, that sustained airborne operations are the most costly operations. Airborne operations are rapid, they are decisive, they achieve their results smartly—or they fail. The prolonged maintenance by air, even in conditions where you have great air superiority, produces air problems which are not always soluble. It is true the 14th Army was maintained in Burma for a long time by air supply, and that to a certain extent vitiates what I am going to say. It is equally true, in the great operation where the 1st Airborne Division was virtually annihilated at Arnhem in spite of the most gallant attempt to maintain that force by air supply, it failed, and it failed at a time when we had, or considered we had, won the air war. That business of maintaining an airborne force after it has landed, even when the anti-aircraft guns have closed in, and when concentration on that objective has been achieved by the enemy, is a dangerous thing, and it is foolish and wishful thinking to deny it. My conception is a small airborne force with no airborne tail: it cannot stand a tail.

The next question is whether you should have airborne troops, or go for a great deal of air portability. I wrote an article recently for *The British Army Journal* in which I went out a hundred per cent. for airborne troops. This was for two reasons: one, because I believe the muddle, the confusion, and the difficulty and problems not only of planning, but of actually finding yourself on the ground, are so great, that unless you make a study of them, you will make a mess of it. The confusion that confronts an airborne man when he is chucked out of his glider or parachute and finds himself facing the gloomy realities of life, is terrific. It is training that counts; the whole layout will be haphazard unless the people are very well trained and the operation has been planned with a full knowledge of all that is involved.

My conclusion is different from yours: it is not that airborne troops should be held waiting for you to use them. They should be used in the normal way, and withdrawn when they are required. The 82nd U.S. Airborne Division and the 101st U.S. Airborne Division went into the battle of Nijmegen and fought there for six solid weeks. In the Ardennes offensive the 101st U.S. Airborne Division held the classic Bastoign position, and the 82nd U.S. Airborne Division held the ground in the North of the Salient. The 6th British Airborne Division was sent over to France and went into the line in the same Ardennes offensive, and fought very well. The 1st Parachute Brigade fought for six months in North Africa without being airborne. The 6th Airborne Division landed in Normandy, and was there for three months. The 6th Airborne Division also fought, after crossing the Rhine, until the end of the War.

Airborne troops should be used as normal troops, and withdrawn for airborne tasks when wanted.

THE CHAIRMAN

General Gale has given us a very clear indication of what the Army wants in the way of aircraft. As he remarked, the extent and scale on which it is possible to provide these aircraft must be decided by the Chiefs of Staff in relation to various other commitments which have to be met. It may be necessary to make reasonable provision for some of the aircraft in peace time; in fact, in the case of certain light aircraft which the General mentioned, it may be false economy not to provide them on a reasonable scale. But with

the more specialized aircraft, particularly such as gliders, it may in peace time only be possible to keep in being research, and more particularly, the operational technique.

The glider, frankly, is rather out-moded at the present moment. I agree with all that General Gale said about its advantages, but we have got to get something better for the next war. It has the advantage of being able to get down on the spot, but you have got to get somewhere near the spot first, and that I am not quite so certain about. However, the point is, we have got to carry on with research and development and keep the technique of operation alive, even though that technique be chiefly applicable to the rather out-moded gliders—the Horsa and Hamilcar, which we have at present. We do not want to have to learn those lessons all over again. Fortunately, the normal transport aircraft is a ubiquitous beast : airborne operations, air lift, and schedule services come alike to it, and, small or large, we are bound to keep some form of transport service going in the Air Force.

As to the design of transport aircraft and gliders, I agree with the General that ease of loading and unloading must be watched. I think we may all—designers and operators, have learnt a lot from the Berlin Air Lift.

The General mentioned the helicopter. That may be the eventual answer, but I think we are still a long, long way from getting a helicopter which will do what the Army wants it to do.

We are also a long way, in my opinion—which is purely a personal opinion—from getting a military transport aircraft which will take off in a very short space, get there very quickly with a very big load, and land on a tennis court, and be able rapidly to decant its contents. It is the sort of designer's nightmare, but of course it may come eventually.

I was interested to hear the remarks of the General on air operations, and I must say I agree with him. I am afraid people are inclined to view airborne operations rather in the light of what happened in Normandy, Holland and the Rhine—the mass operations. Nevertheless, in the early stages of a war, even a war of the 1939–45 variety, the mere fact that we possess even a small airborne force, and more particularly the ability to deliver those airborne troops, is bound to be an asset. If we discard airborne troops completely as out-moded or too expensive, we throw away what may be, in given circumstances, a trump card. It is a question of proportion, a question of ways and means.

I will not keep you any longer. I hope the 8,000-odd readers of the JOURNAL will enjoy reading the General's lecture as much as I hope you, and certainly I, have enjoyed listening to it. (*Applause.*)

The vote of thanks to the Chairman was proposed by Major-General C. P. Walsh and carried by acclamation.

DEVELOPMENTS IN CABLES AND WIRELESS TECHNIQUE FOR SERVICE COMMUNICATIONS

By Colonel Sir A. Stanley Angwin, K.B.E., D.S.O., M.C., T.D.

On Wednesday, 8th February, 1950

Vice-Admiral Sir Charles Daniel, K.C.B., C.B.E., D.S.O., in the Chair

The Chairman: I have much pleasure in introducing Colonel Sir Stanley Angwin, who, as you know, is Chairman of Cable and Wireless Company, and who is going to address us on "Developments in Cables and Wireless Technique for Service Communications."

LECTURE

HAVING undertaken to present this review of progress recently made in cables and wireless communications, together with some indication of future possibilities, I at once found myself faced with the difficulty of covering the subject in the space of a short paper. To bring it into compass I have confined myself largely to the field of long-distance communications and drawn examples from the British cable and wireless commercial network which is sufficiently diverse to cover the general problem.

I propose, therefore, to take the position at the end of the War as a convenient datum line; to note changes of technique which have been made since that date, and to consider further developments already projected or that may be found necessary in the future.

CABLE NETWORK

In 1945 the British cable network comprised some 150,000 miles of submarine cables broadly following four main branches. These connect this Country to distant points thus:—

(*a*) via the Mediterranean to the Middle East, India, the Far East and Australia;

(*b*) via the Atlantic to South America and the West Indies;

(*c*) via the Atlantic to South Africa;

(*d*) via the Northern Atlantic to Canada and thence via the Pacific to Australia and New Zealand.

The system was of course operating at the end of the War below its maximum efficiency.

The cable system is made up largely of the unloaded type of cable. Cables of this type have speed limitations, and the possible speed varies roughly inversely as the square of the length. The slowest cables can take only a matter of four cycles per second (about 27 words per minute) and the shortest are worked up to about 30 cycles per second, or nearly 200 words per minute. The British system has only three loaded cables, that is, cables to which, to compensate for their capacitance, inductance has been greatly increased by the introduction of a permalloy or mumetal helix wound along the cable conductor. The longest of these—3,350 miles, has a speed of over 200 words per minute. The fact that cables give a 24-hour service, are for most part duplexed, i.e., are capable of simultaneously working in both directions, and give a measure of secrecy, has in the past tended to outweigh the speed disability.

The method of signalling used is generally cable code, a variation of Morse in which the signals corresponding to dots and dashes are of equal length but of opposite

polarity. It has been used on cables from the earliest days and is still regarded by many as slightly more efficient than any other system for carrying capacity and reliability when used on unloaded cables. I return later to the question of codes.

The transmitting and receiving gear in use on the cables has been gradually developed over a period of many years and is principally of the electro-mechanical type. At the sending end, keyboard perforators translate the message into punched tape; this is fed into automatic transmitters and in general the message is printed on what is known as a Direct Printer at the distant end. In cases where the message is to be re-forwarded, it is re-perforated at the distant end ready for onward transmission. Whether it is to be printed or re-perforated can be controlled by signals at the sending end. Intermediate stations may have traffic fed to them individually from the sending end, or they can break in and dispose of their traffic when opportunity arises. The control system is very reliable and has the necessary flexibility to allow the easy flow of traffic.

WIRELESS NETWORK

In 1945 the British commercial wireless network, in addition to duplicating the main cable routes, had many feeders operating from stations not on the cable network.

The backbone circuits were then, and still are, operated on the Franklin Beam aerials installed in 1926–27—the original Marconi beam system. Other circuits are mainly operated on rhombic aerials.

By the end of the War most of the Morse services were set up on a re-perforator/printer basis. Manual transcription of high-speed Morse signals remained only where a station with a relatively light traffic load was in correspondence with a number of others on a single frequency. Some 50 per cent. of the total traffic handled by wireless was by this date carried on Double Current Cable Code circuits, i.e., the same code as used on cables.

It has been found impossible to maintain continuous operation over the 24 hours of long-distance short-wave telegraphy, on some routes the hours being limited to as few as six per day. By introducing relay stations with automatic re-transmissions the effective hours of operation have been greatly increased.

The first instance of relay being used on the British network was in 1930, when London–Montreal and Montreal–Melbourne beam services were interconnected to provide the London–Melbourne circuit, when the direct route was unworkable. Since that date many relay stations have been added.

By the end of the War channelling or multiplex working was confined to two-channel working, used to a limited extent on both cable and wireless circuits. The possibilities of increasing the number of channels per transmitter opened up later.

One of the far-reaching changes in transmission practice affecting telegraphy as well as telephony is the adoption of the "single-sideband, suppressed carrier" technique which is being widely applied both to radio communication links and to multi-channel carrier telephony over land cables. This system differs from that of ordinary broadcast telephony in that power is saved by transmitting the actual carrier at a relatively low level—(special means have to be provided at the radio receiver for reinserting or raising the carrier to a high level). Both power and frequency bandwidth are economized by transmitting only one of the two sidebands, i.e., those bands of frequencies immediately above and below the carrier which convey the intelligence corresponding to the modulating signal.

This system was originally applied for transmission over lines and was first used for long-distance radio telephony on medium wavelengths in 1927. It was applied to high frequency telephone transmission between London and New York in 1936, and is becoming standard practice on high-grade radio telephone routes.

The adoption of this system for telegraph purposes is linked with the use of multi-channel voice frequency telegraph working, also originally applied to landline circuits where 18 telegraph channels are produced in the equivalent of one telephone circuit. A system was initiated by the British Post Office during the War giving six-voice frequency telegraph circuits on one radio transmitter using two tones per channel. Each of the six channels functions as in an ordinary inland multi-channel telegraph system to operate a teleprinter. This system of channelling for multi-telegraph circuits is the most promising development towards the objective of co-ordinating radio telegraphy with radio telephony and inland telegraphy with that over long distances.

You will note how much progress in radio transmission technique has followed landline technique.

Otherwise, no great changes in reception methods for telegraphy had been made by the end of the War. The combination of two receivers each using its own aerial spaced sufficiently from the other to neutralize to some extent the effects of fading was common practice. By present standards the receivers were not very selective and not fully protected from interference. Alternatives to the simple form of signalling " current on current off " were being tried. The use of two tones, 600 c/s and 840 c/s, to convey the signals, and the expedient of altering the frequency shift keying (F.S.K.) was also in use and gave marked improvements. As equipment has become available, use of F.S.K. steadily extended until to-day the majority of British commercial services are thus operated. The improvements normally obtained by this system can, however, be more than offset under adverse route conditions in the ionosphere. Under these conditions it may be necessary to revert to ON/OFF keying.

Traffic Capacity

Before passing to the consideration of improvements effected since 1945, it will be interesting to note the normal traffic capacity of the system and how traffic was augmented during the War. The figures illustrate the possibilities of a combination of wireless and cable which I shall mention again.

The following table shows the total wordage in millions and the percentages of traffic, under the various categories :—

Year	*Total*	*Commercial*	*Government*	*Press*	*Social*
1938	231	187 (81%)	12 (5%)	29 (13%)	3 (1%)
1944	704	250 (35%)	266 (38%)	139 (20%)	49 (7%)
1948	624	469 (75%)	62 (10%)	79 (13%)	14 (2%)

This indicates an increase from 231 million words before the War to 704 million words in 1944, when interruptions to cables were at their maximum.

The daily average figure for a normal day's traffic is now 53,000 messages (approximately 1,590,000 words). This figure is more than doubled at a peak period

over Christmas when it rises to 117,600 messages per day, that is approximately 3,528,000 words.

A very high percentage of the total traffic on the system is carried by cable. For 1948 the total wordage of 624 million was divided :—

222 million (36 per cent.) by wireless.
402 million (64 per cent.) by cable.

Between the United Kingdom and the U.S.A., where in addition to the British system there are two American cable companies operating, the cables carry approximately 80 per cent. of the total telegraph traffic. It is important to keep these percentage figures in mind when considering the possibilities of both means of communication.

SIGNAL CODES

One of the most important changes in technique affecting cable and wireless transmission has been the changes made in Signal Codes.

Telegraphy was made practicable by the invention of the Morse Code and the development of long distance cable and wireless communications has been built up on the use of the Morse Code and the employment of operators skilled in the use of that code.

The first big departure from the use of Morse was the use of keyboard instruments such as the teleprinter or teletype on the inland telegraph system, using a 5-unit code in substitution for Morse. Messages are thus directly transmitted from an instrument with a keyboard of typewriter form and directly printed at the receiving end.

One result of this has been the complete abolition of the Morse operator in the British Post Office inland system : these operators formed a large reserve for the Services.

A natural sequence to this change was to exploit the use of the 5-unit system for long-distance transmission to obtain uniformity of practice, and the possibility of through transmission from the inland service of one Country to another when both Countries used teleprinters on their local system.

Following the War, the teleprinter 5-unit system has been largely adopted by the Services for wireless transmission, and is also being largely used commercially in a modified form by American telegraph companies. The 5-unit system cannot, however, be applied to the existing cable network, and this has presented problems for the future which affect both commercial and Service developments.

The second code in use is the original Morse Code, the principal applications of which are :—

(*a*) Long-distance commercial wireless circuits to a limited extent in special cases.

(*b*) Ship and shore communication by the Post Office, the Navy and the Mercantile Marine.

(*c*) Air to ground communication, Civil and Military.

(*d*) Mobile communication, where consideration of weight and space necessitates aural reception and manual transmission, and where the use of telephony is not practicable.

The third important code is Double Current Cable Code (D.C.C.C.), an adaptation of Morse substituting for dots and dashes of unequal length, signals of equal length but opposite polarity. The outstanding advantage of this code is that it is equally suitable for long-distance transmission on existing cables or by wireless. The punched slip which is used at the transmitter end is identical for operating a wireless transmitter or the cable instrument, and reception is on printed tape in either case. This is of inestimable advantage for working between two centres when cable and wireless are both available—for example, between London and South Africa where, according to the loading of the circuit or if diversions are required due to bad radio conditions or interruptions to a cable, either route may be used without any delay due to repunching of tape, which would be the case if the slip had been prepared for 5-unit transmission by wireless, and a diversion was subsequently made to the cable.

One other important factor in the choice of a cable code is the possibility of error in transmission. The 5-unit code which is almost ideal for transmission over lines and on short-distance high-frequency radio-circuits is susceptible to errors when used on long-distance radio-circuits. The errors may be such as to eliminate one element, or add an element to a letter signal, and thus at the recording end substitute one letter for another. Such errors, if they occur in code or cypher messages, are undetectable in transmission and can be most serious.

A great deal of effort has been devoted to modifying the 5-unit system to overcome this difficulty by the adoption of error detecting devices. These systems in effect operate by checking devices involving the use of additional elements, i.e., 7-unit code and the re-transmission of letters shown to be incorrectly transmitted. The number of undetected errors can be very much reduced by the use of these modifications to the 5-unit system, but at the expense of speed.

At present modifications and alternatives are under trial. The possibilities of errors in a message, the effective speed of transmission, and the economics involved are not yet determined. The problem is one of equal importance to commercial and Service users.

The maximum degree of standardization, with the possibility of direct interchanging and switching between different operating agencies is of great importance; between all three Services, between North America and Great Britain for example, and between Service and commercial systems. Agreement on the best means for standardization is not yet in sight. The ultimate solution should be one applicable to inland telegraph systems, long-distance radio and submarine cables. The expedient for the present is the use of code converters. Machines have been designed for this purpose and are now under field trial. These converters are complicated mechanisms but do save the time which would be involved in manual preparation of new tape where a change in code is necessary.

SPEED OF TRANSMISSION

With the adoption of direct printing on long-distance telegraph circuits the speed of operation on each circuit is necessarily limited to that of the instruments used, and is about seventy words per minute. On suitable circuits, such as those on stable wireless routes, two or more channels working at these speeds on each link may be used. This is an alternative to the older practice of working high speed Morse on a single channel.

The old practice for the disposal of heavy commercial traffic by wireless was to send at the maximum possible speed; should transmission conditions deteriorate and errors or omissions occur in the signals, the original slip, that is, the punched tape, was sent again and sometimes sent three times. This practice is still prevalent and is of doubtful efficiency.

Use has been made of transmitting radio telegraph signals at very high speeds, particularly when it is vitally important, on security grounds, for the time occupied in transmitting a message to be very short. It is possible to use very high speeds of transmission if direct printing is not required; when conditions are very favourable, speeds of 1,200 words per minute can be reached. The effective speed allowing for handling, i.e., transcribing the message, is still only a hundred or so words per minute. This is not a sound practice for normal working. When high-frequency signals are sent over long distances they must be reflected one or more times from the ionosphere and from the earth's surface. They split over several different paths after reaching the ionosphere, with different times of transmission, and at the receiving end are liable to distortion. There may be times during the day when very high speeds can be used without excessive distortion, but the higher the speed the shorter these times will be. The higher the speed at which traffic is transmitted, the longer the traffic is likely to be delayed waiting for suitable ionospheric conditions.

THE RECEPTION PROBLEM

It is an axiom that the performance of a radio system is determined by the signal to the noise ratio at the receiver output, the noise being the aggregate of atmospherics and other interferences, and any noise generated in the receiver itself. The received signal depends not only on the strength of that sent out by the transmitter, but on the attenuation en route and reduction by the phenomena of fading.

The outstanding problem in the reception of long-distance telegraphy and telephony is that of overcoming or reducing the effects of "fading" which results from disturbances and variations of height in the ionospheric layers. In considering the medium by which short waves are transmitted over long distances, one is apt to picture the reflections which take place as comparable to those from light rays on a mirror. Even under normal conditions the ionospheric layers are uneven and under ionospheric storm conditions, due for example to "sunspots," may disappear and no effective layer will exist for reflecting the wireless waves. Under the latter conditions short-wave transmission may be impossible, and in all cases due to the irregularities of the layers, fading resulting from interference of waves travelling over different paths is more or less in evidence.

Great ingenuity is displayed in devices to improve reception. Double or Triple Diversity Receivers—Frequency Shift Reception—improvements in directional aerial arrays.

The outstanding attempt in receiver design to overcome "fading" is a system introduced between the United States and the United Kingdom for the transatlantic wireless telephone service known as the Multiple Unit Steerable Antenna. The M.U.S.A. short-wave receiving station has been in operation at Cooling, Kent, since 1942. It is designed to receive in any one of a group of five frequencies situated between about 20 and 5 mc/s.

Briefly, the system comprises sixteen rhombic antennae spaced at regular intervals over a distance of two miles along the great circle path to the American

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Briefly, the system comprises sixteen rhombic antennae spaced at regular intervals over a distance of two miles along the great circle path to the American

transmitting station, and connected to the receiving equipment by sixteen separate transmission lines. The sixteen signals are combined after suitable phase shifts have been inserted in each of the separate transmission lines to give maximum signal strength. By appropriate control of these phase shifts the angle of elevation for reception of the receiving array can be varied to receive at maximum strength the incoming signal, i.e., reception is tuned to the angle of the incoming signal.

This receiver is complicated and expensive—it utilizes 1,079 valves. It does, however, give a marked improvement over normal receiving equipment, and to achieve the same performance by increasing the power of the transmitter would be out of all proportion. The receiver will continue to give reception of signals when on other types they have become unreadable or faded out entirely. By reason of the cost and space required, their utilization is limited to cases where traffic warrants circuits being operated under bad radio conditions. It is probably the optimum extent to which the countering at the receiving end of fading produced by variations in the ionosphere can be carried.

The possibility of countering fading to some extent by a more scientific approach to the selection of frequencies, by the use of automatic relay stations, or by improvements in the selection of the signals at the receiver, seem to be desirable alternatives to the repetition of transmission, in view of the ever increasing need for economy in the use and occupancy of the ether.

FREQUENCY ALLOCATION

Our knowledge of the ionosphere and its influence on the transmission of wireless waves around the earth has been gradually built up since Heaviside and Kennelly first suggested the existence of an ionized layer acting as a reflector, and Appleton and his co-workers showed experimentally that the ionization in the upper atmosphere was in the form of defined layers at different heights, from which waves could be deflected down to the earth.

Once the fundamental basis had been established, concerted efforts were made to apply ionospheric data to radio communication. To state it in its simplest form, the problem is to estimate the frequency which should be used at any particular time to give the most effective transmission between two stations, from a knowledge of the conditions of the ionosphere between the stations; such ionospheric data is available.

The engineer is concerned with estimating the maximum frequencies which are reflected by the ionosphere at oblique incidence, as these suffer minimum attenuation, give maximum signal strength, and are most suitable for communication over long distances. This optimum frequency, known as Maximum Usable Frequency (M.U.F.), can best be determined from vertical incidence measurements at a place midway between the sending and receiving stations. Such measurements are not, however, generally practicable, and forecasting from data obtained at other stations is the only alternative.

A long series of observations at the Radio Research Station, Slough, have obtained data with regard to the diurnal, seasonal and sunspot cycle variations of the height above ground and the thickness of the ionized layer, from which predictions of conditions can be obtained, and graphs have been prepared from which M.U.F. for various distances can be exterpolated. The study of ionospheric prediction was intensified during the War and great progress was made. It has more recently been

widely applied. In the Cable and Wireless Company's system some 240 monthly forecasts are prepared for all the regular routes, and the stations abroad complete the charts by entering observed data, and return them for analysis and comparison with the forecasts.

More ionospheric measuring stations are required to cover adequately the whole of the World; some additions are now being made and the build-up of information for the prediction of the best frequencies to be applied for particular transmissions is steadily accumulating. Within the limits of the unexpected and exceptional ionospheric disturbances, predictions are likely to become more reliable in the future.

A most essential condition for the efficient working of a wireless circuit, indeed an essential condition if interference is to be avoided, is international agreement and regulation of the frequencies employed. The first regulations for the use of frequencies were agreed primarily to ensure communication with ships at sea, and to safeguard the use of the Distress Signal, i.e., the emergency S.O.S. signal.

It has always been recognized that the Mobile Services—first the Marine and later the Air Service—had special claims to the use of frequencies free from interference. Successive international conferences have made allocations of bands of frequencies throughout the spectrum for Mobile Services, Broadcasting, Point-to-Point, Meteorological, Amateur, etc., and with the growth of the use of wireless, difficulty has been experienced in making adequate allocations for all demands.

At present allocation for circuits using frequencies below 27.5 mc/s is based on the Cairo Conference Regulations of 1938, but a new basis was prepared at the Atlantic City Conference in 1947 which has not yet been brought into force, and so far general agreement has not been reached to apply the new table of allocations. Political considerations have clouded the issue and confused any possibility of a solution based on technical grounds or essential needs.

This unfortunate failure to reach agreement—complicated by the great expansion of long-distance broadcasting—nation speaking to nation—the many additional needs of the Air Service—military requirements and the general growth of all services, has already led to an increase in interference between stations, and failing agreement, the near future will undoubtedly become progressively worse. Although the requirements of some nations may not mature, it is clear that a greater degree of sharing of wavelengths will be necessary, with an increased risk of interference, unless more highly developed methods of reception can be employed such as M.U.S.A., for example.

It is clear that in the future, to ensure reliability of communications, greater use must be made of communication by landline, by cable, or over moderate distances, by ultra short wavelengths not capable of causing interference at great distances. The possibilities of deliberate jamming, in addition to interference from working circuits, is not negligible. It is constantly necessary to emphasize the necessity for maintaining clear channels for the mobile services, air and sea, and such other communications for which there is no alternative other than wireless.

Although modern technique has vastly widened the usable part of the spectrum, in that part which can be used for long-distance transmission, the demands have far exceeded the availability. I would emphasize that this difficulty is likely to be as acute in meeting the needs of the Services as for satisfying the commercial requirements. Failure to reach agreement in this international aspect of communications is, in part at least, linked with the state of World politics.

TELEPHONY

Long Distance by Submarine Cable

Long-distance telephony over land was made possible by the introduction of the repeater or amplifier, and circuits of practically any length can be used, provided sea crossings by cable of more than a hundred miles are not involved. This limitation is inherent in the present design of the submarine network and cannot be overcome by further improvements in the cables themselves, i.e., by better dielectrics or magnetic loading.

What may well be a revolutionary change in the technique of long-distance telephony and telegraphy will be made possible by the use of submerged repeaters in cables laid at ocean depths.

Repeaters in cables at comparatively shallow depths are in use. The first was laid in June, 1943, on the Holyhead–Isle of Man cable; another in 1947, on the Anglo-German cable. Others from Holland to Denmark and the United Kingdom are under construction. Application to long-distance deep water cables is a much more difficult problem to which great attention has been paid, both in this Country and in America.

The conditions to be met involve an electrical problem and a mechanical one. The electrical problem seemed at first to be the more complex but has moved faster to a solution. The mechanical one can be stated in simple terms but is far from simple in its solution.

Broadly speaking, the electrical problem is to design a repeater, using valves as amplifiers, to operate in tandem with a similar number—say twenty or more—all supplied with grid and filament current for the valves from the shore ends. The cable must withstand a voltage of 1,000 volts. The valves and all components of the repeaters must be capable of continuous operation for a period of ten years—preferably twenty years—without attention, other than any controls which may be applied at the terminal ends of the cable.

The mechanical problem is to provide a container attached to the cable, which may be at a depth of up to 3,000 fathoms, to withstand pressure of four tons per square inch.

The result of projects now in hand may well, in due course, lead to the introduction of submarine telephone circuits between important commercial centres such as the United States and the United Kingdom, and also to a great increase in telegraph facilities. Linked to this development is the possibility of using a telephone coding device, known as the Vocoder, which has been under development during the last ten years.

Speech is normally transmitted by the simple method of direct transmission of the wave forms of the currents sent out by the microphone. This is expensive in bandwidth, the range of frequencies necessary for the reception of good speech being from 300 to 3,400 c/s, i.e., more than 3 kc/s.

The Vocoder is a piece of apparatus which has been devised as an alternative to transmitting the whole of the wave form and frequencies. It samples the speech in a number of sub-bands spread throughout the total speech band and then transmits the basic information in each side band over a channel 25 c/s wide; i.e., it analyses the speech and automatically telegraphs the analysis. At the receiving end the new

speech is synthetized by controlling or modulating the output from local oscillators in accordance with the variations of the analyser as telegraphed by the transmitter. The synthetic speech has intelligibility but lacks naturalness—the quality of the voice is lacking.

More than six times the number of telephone channels can be made available by the Vocoder on the same frequency band as normally required for one telephone channel. It may be described as a telegraph method of instantaneously transmitting speech. One important feature which follows is that, as for other telegraph transmissions, it may be coded, giving the valuable quality of privacy. It can be made unintelligible unless recoded. The effects on the economics of a submarine telephone cable are obvious.

Short Distance, Mobile, and Aeronautical Communications

I have already disclaimed any attempt to cover the whole field of telecommunications in this paper. and even in considering long-distance communications have dealt with essential principles and general trends rather than details of technical development.

With regard to progress in the field of short-distance communications, mobile equipments and the specialized requirements for aeronautical purposes, some important lines of development may be quoted. Simplification of operation, particularly of tuning, stress on reliability of operation in extremes of climate, temperature and humidity. The use of crystals, natural and artificial, giving great precision in frequency for appropriate circuits. The extension of the available part of the spectrum to higher and higher frequencies is continuing with accumulated knowledge of the possibilities and limitations. A 5,000 mc/s eight-channel pulse-modulated radio telephone set for Army communications was developed during the War, and was a spectacular advance.

NEW COMPONENTS

This has been a starting point for many improvements—valve technique has advanced—the vulnerability of the valve in equipment where reliability and long life are essential is still a serious problem. Where the complexity of the equipment involves a multiplicity of valves for such purposes as air to ground, and landing equipments, where safety is an important factor, reliability over a specified period of life may be vital. This has led to such devices as the " ruggedized " valve which provides for withstanding shock as well as long emission life. A long life in a valve is most desirable : what is even more essential is that its predicted life should be attained. The random nature of valve failures is the difficulty to be surmounted.

A new device, the transistor, may play a part in minimizing the use of valves. It may be briefly described as an imperfect contact or rectifier device without anything comparable to the filament of a valve and using very minute power, which will perform as an " amplifier " with some limitations. Within these limitations, and with a greater knowledge of the materials used in its construction, and the mechanism of the process, it may be a most useful adjunct and act as a valuable substitute to the thermionic valve.

With this development may be classed the work in progress on new materials, conductors, insulators, partial conductors, magnetic materials which will contribute something spectacular to the improvement of the art of communications. With the

increasing knowledge of the molecular structure of materials, it is a possibility that, rather than choose the best known material for a particular electrical purpose, a material may be specified with given properties which can be designed by the chemist and physicist.

SUMMARY

To summarize the position, wireless and line communications, i.e., landline or cable, should be considered as complementary.

Wireless for mobile units is essential and should be given priority. Wireless is often essential in the first instance over long distances where no communications exist, because of the speed with which it can be erected.

Line communications are preferable where a large volume of traffic has to be dealt with, and when there must be continuous operation, and delays due to atmospheric interruptions or interference cannot be tolerated.

Considerations of security may weigh in favour of cable or of landline in some cases, alternatively in favour of wireless.

The speed of repair is an important consideration.

The vulnerability of large wireless stations, even although they are isolated on the one hand, and the vulnerability of long cables or long lines need to be considered. Modern practice of using a light cable or a pair of wires with buried repeater boxes is very different in this respect from the heavy lines on poles which used to be necessary.

Spectacular progress in wireless has somewhat overshadowed older forms of communications. Recently progress in line and cable has been almost equally great. The best results are obtained from an appreciation of the capabilities and defects of both; it usually results that major requirements are met by the use of both systems.

DISCUSSION

MAJOR-GENERAL VYVYAN: With regard to the security of submarine cables, is it possible for submarine cables to be tapped by a submarine? Has it ever been done?

THE LECTURER: An experiment was carried out in an endeavour to see what a submarine could do in the way of tapping a submarine cable. I should say that over the majority of the length of a submarine cable it is quite impossible to get sufficient proximity to the cable to give anything in the way of interception. It is obvious that at the shore ends, close inland, it should be possible, by laying a feeder cable parallel to the submarine cable over a sufficient length, to obtain some interception. I think that the answer is: possibility—yes; probability—very remote, unless there is a complete failure of the Country owning the cable to have any control of the sea-shore in that area.

CAPTAIN A. D. LENOX-CONYNGHAM, R.N.: Would you draw a comparison between the cost of a cable system and a radio system? If you had to start a new communication channel between two points to carry first-class traffic, and a large amount of traffic, and had the option of using either radio or cable, what would you expect the cost of the two schemes to be?

THE LECTURER: The capital cost of the cable side completely overweights it. On annual costs, over a period there is little difference between them, though it is still slightly in favour of radio. On traffic-carrying capacity and the ability to maintain the service without interruption over difficult periods, as well as over good periods, it is another matter. Commercially there is very little between them, but again, as I have said, the ideal is to have both.

CAPTAIN E. ALTHAM, R.N.: Shall I be treading on dangerous ground if I ask whether there has been any development, particularly since the War, in the scrambler? There

was a certain organization with which I had a great deal to do during the War, and it was one of our greatest pains in the neck that we could not be sure that a scrambled communication would not be unscrambled. Radio telephony, of course, was used mostly on the highest plane, but our impression was that the higher the plane the greater the indiscretions; hence our qualms.

THE LECTURER: If I may confine myself to the purely commercial angle, I may be able to answer that. The scrambler, as far as commercial telephony is concerned, is applied to give not secrecy but privacy. You will appreciate the distinction. It varies from the simple idea of inverting the speech, reversing the frequencies, in which case very little initiative is required to make it intelligible, to the most complex system in daily use, where the speech is split up into five bands, and those bands may be transformed and inverted. No one, I think, would claim secrecy, but for all commercial purposes full privacy is obtained, with the knowledge that nobody could decipher without a very complicated piece of apparatus at the other end.

CAPTAIN ALTHAM: There is in fact a slight distinction between privacy and secrecy?

THE LECTURER: If you were selling it commercially, you would say that you could give privacy, but you would hesitate to say that you could give secrecy.

COMMANDER G. M. BENNETT, D.S.C., R.N.: You mentioned the Vocoder. I know nothing about the instrument, other than what you have said, but in the Services the greatly increased use of voice radio has raised the problem of keeping satisfactory records of conversations. Is there any possibility that the Vocoder, with its method of analysing speech, could be developed so that it would turn speech not perhaps into writing but into a printed message? In other words, is there any possibility of it providing a method of keeping an automatic written record of a voice conversation?

THE LECTURER: Definitely. The Vocoder analyses speech and transmits it, and that operates a piece of apparatus at the other end which synthesizes the speech and gives you something equivalent to the speech itself. If you record that analysis of the speech, whether you use it immediately to operate the synthesizing mechanism, or store it and use it at a future date does not matter; at a future date you will get exactly what you would have got at the time.

COMMANDER BENNETT: You mean that a stenographer could listen to the record and transcribe it. I was, however, wondering whether it could be developed to do the job automatically—to save the manpower at present necessary for logging voice conversations. Could that be done?

THE LECTURER: No. I would not say that it would be beyond ingenuity to do it, but it would be a very complicated device indeed. I have in mind something which was done on those lines during the War, but, having found out that it was possible, it was abandoned as being so cumbersome and costly that it was not worth the effort.

THE CHAIRMAN: I take it that all wireless transmission is as susceptible to direction-finding as it always used to be? There is no development there?

THE LECTURER: No.

THE CHAIRMAN

I do not think that there is much for me to sum up, but I should like to express my agreement on the question of cables and radio with Colonel Sir Stanley Angwin. I had a certain amount to do with wireless many years ago, and the question of cables *versus* wireless frequently came up. There were always those who said that the day of cables was over. No doubt that will come up again, but I share the view of Sir Stanley that you must have both, and particularly cables, from the Service point of view. I express my complete agreement with what he has said.

It only remains for me to express our very grateful thanks to Sir Stanley Angwin for the most instructive and agreeable address which he has given us this afternoon.

THE WAR IN THE PACIFIC—1943-44.

GUADALCANAL TO LEYTE GULF

By Lieut.-Colonel H. E. Fooks, O.B.E.

PART I

AFTER the Japanese surprise attack on Pearl Harbour on 7th December, 1941, their Higher Command estimated that in spite of the immense damage done to the U.S. Fleet in that attack, the Americans would recover all that they had lost within twelve months, after which their strength would increase much faster than that of Japan.

The United States was a self-supporting Country with a population half as much again as that of Japan, and her manufacturing and shipbuilding potentialities were enormous compared with those of her enemy. Japan, for example, had very little steel except scrap, and her only oil supply was from the recently captured Dutch East Indies. The Higher Command formed the conclusion that for two years Japan could fight a successful war, but after that time there might be difficulties.

Guadalcanal, as already related, fell to the Americans early in 1943, not quite fifteen months after War was declared.[1] The fall of this small island put *finis* to any hopes that the Japanese had of invading Australia, and in fact was the beginning of the change from the offensive which they had so far maintained, to the defensive. The speed of the American recovery surprised Japan, and although in the Spring of 1943 the Allied forces were only on the outer perimeter of Japan's defences, it was obvious that they would very soon be probing deeper.

In their first year of war the Japanese had comparatively little opposition to contend with, and their forces spread out very rapidly to a long line which stretched from the Aleutian Islands to Wake—Marshall Islands—Gilbert Islands—Solomon Islands, through the northern half of New Guinea, then South taking in the rest of the Dutch East Indies and North, taking in the Andaman Islands up to the Indo-Burma frontier. This was an enormous length to hold, but it was held. Large numbers of troops were posted along it, and as they were fighting in only a few places, they spent their time making airfields and fortifying their positions until they considered them impregnable. After the fall of Guadalcanal, the Japanese Higher Command began to realize that even for an army the size of theirs the line was too long, in fact " they had bitten off more than they could chew."

Japanese Policy

Opinions were divided as regards future strategy. One part favoured a policy of passive defence, holding what they had and resisting attack in the hope that the Americans would soon weary of losing large numbers of men and material in trying to break the defence line, and would agree to an early peace. The other party, under the Commander-in-Chief of the combined Imperial Navy—Admiral Mineichi Koga, held to the doctrine that the best form of defence is attack. Koga felt sure that the only chance for his Country's ultimate victory was to bring off a successful naval engagement against the American fleet ; but, if success was to be ensured, the sooner this battle took place the better, for he knew that the U.S. Navy was increasing in strength, while the Navy he commanded was not.

[1] See " The Guadalcanal Campaign " in the Journal of November, 1949, p. 591.

Koga was far-seeing in that he was sure that the attack against Japan would come from the East—from the United States; an attack from the West was unlikely as the Allied fleet in European waters had far too much to do for some time to come to seek a battle in the Far East. Koga's views prevailed and, in order to carry them out successfully, he was allowed to keep his main fleet concentrated at Truk in the Carolines—not unlike a spider in the centre of its web, able to strike in any direction.

Truk[2] was an atoll which the Japanese captured from the Germans in 1915, and it had been held as a mandate ever since. Little information about it was available to foreigners, who were not allowed to visit the place. Japanese propaganda encouraged the outside world to believe that it was the strongest naval base in the World.

Undoubtedly the position of Truk from a strategic point of view was almost ideal. It was a collection of small islands situated in a triangular shaped atoll whose perimeter was 150 miles in length, and the depth of water in the lagoon made it a perfect harbour, capable of taking any size of fleet then existing. The main entrance to the lagoon was Piaanu pass, which was five miles wide but could be closed to hostile ships by the guns on the largest island in the group—Tol, which was opposite the entrance. A circle of 1,000 miles radius with Truk as the centre, would include the whole of the area—Wake, the Marshalls, the Gilberts, the Solomons, and New Guinea—the present likely battle ground.

During the campaign of Guadalcanal the Japanese made great efforts to capture the Australian Mandated territory of Papua in New Guinea, their main objective being the very good harbour of Port Moresby. Papua was defended by a weak Australian Division which for a long time held the enemy in the mountainous jungle of the Owen Stanley range. However, the Japanese eventually pushed them back to a point only 32 miles from Port Moresby. There the Australians, who had been reinforced by the 32nd U.S. Division, not only stopped them, but drove them back and cleared them out of Papua. Both sides must have suffered terrible privations, as the ground fought over was thick mountainous jungle and swamps; mosquitoes, leeches, hookworm and dysentery must have caused more havoc than did rifle fire.

About the end of January, 1943, the Allies had driven the enemy as far North as Morobe, and were now threatening the Lae-Salamaua area, still held by the enemy. The Japanese hastened to reinforce this area, by sending troops in a convoy of six transports escorted by eight destroyers, from New Britain to Salamaua. Fortunately an American patrol aircraft spotted the convoy and reported it, with the result that when it had reached a point about 60 miles East of its destination it was attacked by a strong force of Allied aircraft. The attack went on throughout the day and was continued in the night by Allied motor torpedo boats with the result that four destroyers and all the transports were sunk. The remaining four destroyers, having rescued as many survivors as they could, escaped. The enemy loss in troops was over 3,000 men—slightly more than half the force that was embarked.

When the Philippine Islands were about to fall into Japanese hands, General MacArthur, the Commander-in-Chief, was ordered by Washington to escape with his staff to Australia. He then became Commander-in-Chief of all Allied forces in the South-West Pacific area, his headquarters being at Townsville in northern Queensland. Here he collected an Allied force which he trained in all forms of jungle and amphibious warfare. The force, which as time went on grew into an army of

[2] See Map facing p. 458.

well over 250,000 men, began with six American and five Australian divisions, but these were weak in numbers. The Australians included two divisions from the Eighth Army which had, in fact, held Tobruk.

General MacArthur's Strategy

In May, 1943, at the " Trident " Conference held in Washington, it was decided that Allied strategy in the South-West Pacific was to be a step-up in the pace of the advance towards Japan. This was exactly General MacArthur's policy, but before it could be put in motion he had to get sufficient ships to carry his troops and a naval escort to defend them, for the area over which he intended to fight was, with the exception of New Guinea, more water than land. Until now, his forces had cleared up Papua, which besides relieving Port Moresby, had also acted as a counter-attack to the Japanese when they were pressing very heavily in the Guadalcanal campaign.

MacArthur's plan included attacks in the New Britain and New Ireland areas, and Bougainville, as well as pushing West along the North coast of New Guinea. However, he was unable to carry out this plan until after the " Trident " Conference as he had not the shipping to transport his forces.

MacArthur's strategy was based on the principle that, provided the Navy and Air Force could give him sea and air protection, he would land troops where the enemy was weak, and confine the stronger Japanese forces in pockets from which, owing to incredibly difficult terrain and American sea and air superiority, they could never break out. In fact, he did not intend to attack individually and occupy each and every outpost held by the enemy—to do this all the way to Japan would take years and require far more forces than he would have at his disposal; his plan was to leap-frog many of the enemy's strongholds and isolate them. The plan worked perfectly, and at the end of the War thousands of enemy troops who had never been in action, and whose lines of communication had been cut by this leap-frogging, were " picked up " starving. As MacArthur put it, " they were rotting on the vine."

In June, 1943, MacArthur formed the Amphibious Force. As time went on this grew out of all recognition. It became known as the VII Amphibious Force and was made up of one American Marine and four Army divisions; one Australian division; and one New Zealand brigade. To begin with, the only fighting ships he had were a few destroyers and submarines, and some minesweepers which acted as escort to a fleet of transports and landing craft of all kinds which carried the force. Admiral Barbey, U.S.N., was in command, and his flag was carried by a repair ship. But as time went on, battleships, carriers and cruisers were added.

The Amphibious Force had its first try-out in action against two small islands off the North coast of Papua—Kiriwina and Woodlark. The invasion of these islands and their capture took longer than was expected owing to bad charting, ships running aground, and all the usual teething troubles that new forces have to undergo. There were very few Japanese on the islands, and the only resistance encountered came from an Australian mission which very gallantly organized its followers to resist the invasion, thinking that it was a large-scale Japanese attack. However, there were no serious casualties, but it shook the divisions down, and gave them just the kind of practice that they needed.

THE U.S. PLAN OF THE OFFENSIVE

Higher Command at Washington now considered that their forces were getting superiority over the enemy in the air, on the sea and on land. In these circumstances

they laid down an offensive strategical plan for the Pacific area. The main object of this plan was that all forces were to be ready for the attack on the Philippine Islands by the end of 1944. There were to be two main advances. One would be from the East under Admiral Nimitz, U.S.N., whose force would consist of nine Marine and Army divisions. His objectives were :—

(1) The Gilbert and Marshall Islands, where airfields were to be captured and bases formed, so as to act as a jumping off ground for their next objectives further West.

(2) The Marshall and Caroline Islands.

This eastern attack was the top claw of a pincer movement of which the southern attack was to be the other.

The other advance was to be from the South under General MacArthur, whose force would consist of one Marine and five U.S. Army divisions, six Australian and one New Zealand division : (the VII Amphibious force was included). The objectives were to be :—

(1) The capture of New Guinea and the Solomon Isles.

(2) The neutralization of New Britain and New Ireland.

Air support was given to both attacks, and the U.S. Navy was ordered to destroy the enemy's fleet and to give all the help it could to both advances. Great stress was laid on the importance of capturing airfields, and the construction of landing grounds. The Americans had learned from experience that carrier-borne aircraft are of no use if the carrier is sunk, but that an island used as an airfield is unsinkable.

The enemy had landing grounds on atolls and islands all over the battle area, while the Allies had very few airfields on land to begin with—a disadvantage which took time to overcome.

The Solomon Islands

On 30th June, 1943, MacArthur's force moved up the Solomon Islands to capture two important airfields situated at Munda and at Villa, both on the island of New Georgia. It was from these two airfields that the aircraft which were constantly attacking American troops in Guadalcanal, were flown.

The first step was to take the small island of Rendova, and an American Marine regiment was landed there. From here the airfield at Munda was bombarded by artillery firing over the straits between the islands. The Japanese aircraft attacked in some strength, but were driven off by the Americans after they had succeeded in sinking one of the Allied transports. One destroyer fell to a Japanese shore battery.

Munda and Villa did not fall at once, and in order to reinforce their troops the enemy resorted to their Guadalcanal system of convoys, known as the " Tokyo Express." These were fast convoys, heavily escorted, which tried to run through and land troops and supplies by night. They made two attempts, both of which were stopped by Allied naval units, but they were able to claim that in the fighting which ensued they had sunk one Allied cruiser and two destroyers, and had badly damaged three more cruisers. After five weeks hard fighting by sea, by land, and in the air, the Allies occupied Munda and put the airfield to their own use. The Japanese did their best to evacuate their garrison, but in their attempts to do so, Allied destroyers and " PT " boats took heavy toll of the transports and not many men escaped.

The enemy tried to counter the Allied advance by means of air attacks. In these, however, they lost very heavily. To give an example—in one battle the enemy attacked with sixty bombers escorted by sixty fighters. They were met by a hundred Allied fighters drawn from carriers and land-based army units. The Japanese lost 107 aircraft while the Allies lost six. At this rate the Allies soon began to get the control of the air.

What, it may be asked, was the cause of this disparity? It is not easy to find an answer. The Allied fighters were slower than those of the enemy, but their bombers were faster. The pilots ought to have had the same amount of experience and training and no one could accuse the Japanese airman of lack of courage. Perhaps someone else will be able to answer this question? One thing which was very obvious, was that the enemy could not afford to go on losing aircraft at this rate; he had not got the material to replace such losses and, what was more important, he had not the fuel or the time to train new pilots and air crews.

New Guinea, Rabaul and Kavieng

In September, 1943, General MacArthur turned his attention towards New Guinea; he wanted the Lae-Salamaua area which was still in enemy hands. At the end of August, an Australian force advanced from the West on Salamaua, and at the same time an amphibious force landed South of the same place. On 4th September, while the enemy were fighting for Salamaua an Allied force landed East of Lae and a parachute regiment was dropped on, and captured, a large Japanese aerodrome 19 miles North-West of that place. Lae being attacked from all sides, was occupied by the Allies on 16th September, Salamaua having fallen a few days earlier. From here MacArthur moved to Finchshafen, which fell on 2nd October. The garrison of this last place attempted to escape in barges to New Britain, but they were intercepted on the way across by Allied "PT" boats, which immediately attacked them and sank the barges. Most of the escaping occupants were drowned. The next step for the Allies was up the New Guinea coast to Saidon, where on New Year's Day, 1944, the Allied flags were duly hoisted. By the middle of February of that year the whole of the Huon peninsula was in Allied hands.

While MacArthur was dealing with New Guinea, the Allied advance along the Solomons had been moving steadily northwards. On 1st November, 1943, a Marine division, helped by a New Zealand brigade, landed at Empress Augusta Bay on Bougainville Island. Advancing inland, the Allies soon captured three good airfields at the cost of very few casualties. These were at once put into use and, at the same time, a naval base was established. The importance of these airfields lay in the fact that they were within easy range (three hundred miles) of Rabaul and Kavieng. The former, in New Britain, was the principal Japanese naval headquarters South of Truk; the latter, on the North tip of New Ireland, was also a very important naval harbour, and it was from these two places that the enemy sent out their main naval and air attacks. Both places were marked down in the Allied plan for elimination.

About this time the Allies were making preparations for an assault on the Gilbert Islands, and the major portion of their fleet was being concentrated near the Ellice Islands to take part in the attack. Vice-Admiral Halsey, U.S.N., was left behind with a small naval force to cover the Solomon operations. The Japanese had a strong fleet at Truk, under Vice-Admiral Kurita. He received orders to go to the assistance of Japanese forces who were being hard pressed at Bougainville, and he sailed at

once. Fortunately, an Allied air patrol spotted this move, and reported it and its course to Admiral Halsey, who correctly surmised that Kurita would have to stop at Rabaul to refuel. Halsey at once moved two carriers and their escort in that direction. In his own opinion, he would be lucky if he ever saw them again because, having played an important part in covering the landing at Bougainville, they were short of fuel and ammunition. However, he risked it, and when on 5th November, an Allied air patrol reported the presence of the enemy in Rabaul, he ordered the carriers to strike hard. Japanese aircraft were up, awaiting this attack; nevertheless, the Allied aircraft created havoc in Rabaul harbour, which was crammed with warships refuelling. Kurita having had several of his cruisers severely damaged, had to retire to Truk. The Allied aircraft losses were three against the enemy's 25. Halsey had taken a big risk, but the result was worth it.

A few days later, after having been strongly reinforced, he made two more raids on Rabaul within a week. Both of these raids were supported by heavy naval bombardments which so damaged the docks and fuel dumps on shore as to greatly reduce the value of the harbour as a naval base.

A month later Kavieng received the same treatment. Thus, by the end of the year, both these places, although uncaptured, had been so neutralized that they were of no use as bases to the enemy.

It is interesting to compare the losses sustained by the Allied and Japanese air forces in the fighting over Rabaul as shown in the official U.S. Navy reports:—

5th November	Allies	...	3	Japanese	...	25
11th "	"	...	3	"	...	50
13th "	"	...	7	"	...	24
			—			—
	Total		13			99

An average of 7½ to 1 in the Allies' favour. From now on they held command of the air and they never lost it again.

By the end of February, 1944, New Zealand troops captured Green Island on which an airfield controlled the sea passage between Bougainville and New Britain. The Allies had also made a landing on the southern end of New Britain, and had captured the weakly-held Admiralty Islands. As they were already in occupation of the Huon peninsula of New Guinea, they had command over Vitiaz Straits.

The Americans based a fleet of PT. boats on Dreger harbour close to Finschafen. These boats were about eighty feet long, made of wood, and were manned by a crew of two officers and nine men. They were very fast. Their armament was varied to suit the occasion; sometimes they carried two to four torpedo tubes, sometimes depth charges or mines, and later rockets. Their gun armament consisted of dual ·5 in. machine guns.

The Japanese garrisons, isolated in New Guinea and in the Solomons, had still to be fed and the enemy did his best to get supplies through to them, either by means of the "Tokyo Express," submarines, or barge convoys. The last greatly attracted the "PT." fleet, especially when they were in the neighbourhood of Vitiaz Straits, and in three months (November, 1943, to January, 1944), they sank 147 supply barges. The submarine supply line was not a success. Supplies were dropped close to the shore in watertight containers in the hope that they would finally be beached and found; some did reach the beach but most of the containers were lost. The effect on the isolated garrisons when they realised that their Country could not support them may be imagined.

The Central Pacific Islands

The Gilbert, Marshall, Mariana, and Caroline Islands are all atolls. In the first two the atolls are generally flat, while in the other two the ground in places rises to several hundred feet above sea level. Three of this group of islands had been held by the Japanese since the 1914–18 War; the Gilberts they captured from Britain in 1942. All the more important islands in these groups had been fortified by the enemy, and on several of them they had built airfields. The following details of the defences on Betio island in Tarawa Atoll, in the Gilbert group, may be regarded as typical.

All sea passages that were not in use were blocked, others were improved by deepening them. Surrounding the island, except for necessary passages, was an anti-tank ditch protected by a thick barbed wire fence and several hundred anti-tank obstacles; the latter were all below sea level.

Pill-boxes were raised, trenches cut, and caves dug and strengthened with steel casemates and girders. The jungle was cleared to provide an airfield. The palm trees being a very hard kind of wood were used to give head cover in the trenches. The troops on the island had been there since the start of the War; they had little to do except to improve the defences until—as they thought—it was impregnable.

The location of the Gilbert Islands, as reported on by the Chief of U.S. Naval operations, "was of great strategical significance, because they lay North and West of other islands in our possession (Ellice and Phoenix Isles) and immediately South and East of important Japanese bases in the Caroline and Marshall Islands."

In October, 1943, Allied aircraft attacked enemy bases at Wake and at all the more important defended atolls in the Gilbert and Marshall Islands. These attacks had three objects: to gain information, to soften the defences and the main defenders, and to keep the enemy guessing where the main Allied attack would fall.

The enemy retaliated by attacking the Ellice Islands from the air. As usual, their losses in aircraft were much larger than those of the Allies.

About the time that Admiral Halsey was bombing Rabaul, Admiral Spruance was ordered to capture the Gilbert Islands. For this purpose he was given a force which included battleships and carriers, an amphibious division of Marines, and an Army Regiment—approximately a British Brigade, also all the transports and landing craft that he needed. Amongst the landing craft for the first time were included those famous amphibians known as the DUWKs.

Spruance decided that the best way of taking the Gilberts was to capture the two main atolls in the group. These were Tarawa and, a hundred miles North of it, Makin. Tarawa had a small but important airfield at its south-western end on the island of Betio, from which the enemy were able to control the rest of the group. Both Tarawa and Makin were heavily fortified and strongly garrisoned. The Marines were ordered to take Tarawa, and the Army to take Makin.

The capture of these two islands, especially Tarawa, was a tough task. In the United States it is now referred to as "The Epic of Tarawa"—the hardest fought battle in the history of the U.S. Marines. The real battle was for Betio Island. The fighting in Guadalcanal, Bougainville and New Guinea was on ground with sufficient room to give commanders an opportunity to practise the art of tactics. At Betio, when troops landed there was only space for them to go straight forward or to remain still. The fortifications included eight 8-in. guns which had been removed from

Singapore; twenty-four 5-in. guns; anti-aircraft guns by the dozen; and machine guns by the score. All the gun emplacements and pill boxes communicated with each other by underground tunnels.

At an early hour on 19th November, American cruisers set the ball rolling by bombarding Betio Island. The garrison took cover and did not deign to reply. On the morning of the 20th, while it was still dark, the attacking force embarked in landing craft some eleven miles distant. They were to strike at dawn. Battleships and cruisers now began a bombardment of the island, in order to soften the defences and frighten the defenders, and again the Japanese reply was desultory. As dawn came up the landing craft set off for the shore and, to cover them, the carrier-borne bombers made repeated attacks on the defenders. As the landing craft approached the shore, any hopes that the occupants might have held of the enemy being too dazed by bombardment to put up a defence, were shattered.

The enemy's fire was heavy and accurate. Most of the landing craft were hit, many of them running on to the submerged reef or the anti-landing obstacles put up by the Japanese. When this took place the Marines disembarked in the water and waded ashore. However, owing to the accurate fire of the enemy, very few were lucky enough to get as far as the beach. By the time it was dusk, there were a few score of Marines holding a strip of shore on the North side of the island. These were heavily reinforced during the night, and on the next day, they were able to extend their line considerably. The enemy resisted desperately. Every gunpit, pill-box and trench, had to be individually cleared and this was done with mortars, flame-throwers and grenades. Even cruisers and destroyers tried to lend a hand, and they came in close to the shore and used their 5-in. guns; but as the damage they did was more to their own troops than to the enemy, they were appealed to and reluctantly withdrew. On 23rd November more reinforcements attacked the eastern end of Betio, and the enemy were slowly driven up to the western end of the island. Suddenly, without any warning, the enemy started pouring out of their dugouts and forming up. Then, with their officers in front, they charged their attackers. Machine guns and mortars laid them out by the hundreds, none of them took cover and they continued to advance as long as they could stand up. Next day was spent by the American forces in knocking out snipers; all organized resistance being over. Nine Japanese out of a garrison of 4,000 men were captured, the rest were killed, while the American Marines lost just over 1,000 officers and men killed, and about 2,500 wounded and missing.

Makin was captured by army troops by the end of the third day. The soldiers had a very much easier task than the Marines, owing to the enemy putting up much less resistance than at Betio. A third island, Abemama, was also taken. Here the garrison consisted of one platoon of Japanese marines. After firing a few shots at their opponents, the platoon committed " Hari-Kari " *en masse.*

The Allied supporting fleet, however, did not escape damage. During the preliminary bombardment of Betio, a 16-in. gun charge ignited in a turret of the battleship " Mississippi " before the breech of the gun had been closed. The result was that this ship had her turret wiped out, and lost 45 officers and men killed, and another 20 men wounded.

The Japanese at Truk heard the news that the Gilbert Islands were being attacked and, although they were too far away to be able to intervene with their fleet, they could and did order submarines in the Rabaul area to attack the American fleet in the Gilbert area. Six submarines arrived, one of which was sunk almost at once.

But another was lucky enough to torpedo and sink the U.S. carrier " Liscome Bay," which was the flagship of Rear-Admiral Mullinix. The Admiral, the Captain and a ship's company of 54 officers and 650 ratings went down with their ship. Japanese aircraft which had tried to interfere in the attacks on the islands, were driven off, but not until they had torpedoed and put a light carrier out of action.

The assault on Betio, which had cost the Americans such heavy losses, taught them several lessons on amphibious warfare. The most important of these was that it was no use trying to attack defended islands, unless the defences were so heavily bombarded before the attack that they were completely pulped. The bombardment of Betio was considered to be heavy but, as casualties proved, it was not anything like sufficient. The other lesson learned, was a minor, but still important one. The use of flame-throwers in underground passages where the enemy stored his ammunition was not to be encouraged. Flames on the ammunition set it off, with the result that not only was the attacking party inside the passage blown up, but their friends fighting in the open just above them were also killed.

The Marshall Islands and Truk

The Japanese knew that the Allies were preparing an attack on the Marshall Islands. This group contained many large atolls which were suitable for bases spread over a large area. A line drawn from Eniwetok in the North through Wotje, Maloelap, Mille, and Jaluit, makes a 700-mile arc of a circle around the largest atoll of the group—Kwajalein. In the Gilberts there were only about three atolls worth attacking, in the Marshalls all the atolls mentioned might be attacked, and the problem for the enemy was which ones were they to defend. The combined staff of the Japanese forces held a conference at which they decided that the Allies would attack Mille, Wotje and Maloelap. All the larger atolls were defended, but these three were strongly reinforced. The Allies did not help the Japanese to solve the problem. All through the month of January, land-based and carrier aircraft were flying over the 700-mile arc taking each island in turn, and giving it a " softening." Admiral Spruance was in command of the combined Allied operation to capture the Marshall Islands, and he decided that his main objective would be the atoll Kwajalein. This atoll was the largest and most central one of the whole group. The atoll is made up of a string of islands running in the shape of a segment of a circle, about 170 miles long, enclosing a lagoon whose average width is about 12 miles. None of the islands is as much as a mile in width. At the West end of the atoll is the village of Ebadon, half way down the North side is Roi Namur, and at the South end is Kwajalein, from which the atoll gets its name.

Admiral Spruance—in command of the operation, had given Vice-Admiral Mitscher orders to take his carrier force and soften the defended islands in the Marshall group. For days the carriers accompanied by battleships and cruisers, and with some 700 aircraft on board, had been achieving this task. On January 30th the carrier force was spread on an arc to stop any enemy fleet which might be sent out from Truk, to interfere with the operation.

Spruance decided to land his forces on Kwajalein on 31st January. The day before he arrived close to the atoll with a powerful fleet of 8 battleships, 12 carriers, 4 cruisers, 38 destroyers, and transports which carried his landing forces. There were two landing forces—the Northern and the Southern. Each of these consisted of a reinforced marine division and occupation troops. The Northern Force was to take the airfield on Roi-Namur by landing on two small islands just South of their

objective and work North. This force was also responsible for dealing with any opposition from the two islands Ennuebing and Mellu guarding the North Pass into the lagoon. The Southern Force was to take Kwajalein island itself.

As a preliminary to the landing the guns of the whole fleet bombarded the landing points while the aircraft bombed them. To quote a naval observer, " the effect of the gun fire on Kwajalein was devastating. The island looked as if it had been picked up to 20,000 feet and then dropped. The ground was so torn up that even movement on foot was difficult, and it was impossible to make out where the sea wall had stood. Practically all beach defences had been hit and all installations had been destroyed by gunfire due to ships closing in and using open sights."

After that, the troops landed and fought for the next four days before the islands were captured. The Americans had put into practice the lesson they had learned in Betio. Thanks to the bombardment, the resistance they encountered was mild compared with that at Betio. Out of a force of 40,000 men, they lost 320 killed and 500 wounded. The Japanese at Kwajalein atoll lost 8,000 killed and 400 prisoners. What the losses on the other atolls were is not known, but they must have been considerable. Amongst the Japanese killed was Admiral Yamata. A fortnight later, it was decided to capture Eniwetok atoll, the most northerly one of the group and, at the same time, to raid the main enemy naval base—Truk, in the Caroline islands.

Vice-Admiral Spruance was to attack Truk. He took with him a force consisting of 7 battleships, 9 aircraft carriers, 10 cruisers and 28 destroyers—a strong enough fleet to deal with any hostile force he might encounter.

At dawn on 16th February, the carrier aircraft attacked and caught the enemy off their guard. In the battle that ensued, the Allies claimed that 56 enemy aircraft were destroyed in the air, and 72 more on the ground. Their own losses were 4 aircraft. By the time this battle was over the fleet had arrived, and it proceeded to bombard the shore installations until they were smashed to bits. The next day the fighting was resumed. Unfortunately, only six small warships were found in the harbour, but it was crowded with transports, very few of which escaped.

The result of this raid was that the Allies lost 25 aircraft. On the other hand, they claimed 340 enemy aircraft destroyed, 2 light cruisers, 3 destroyers, and 26 transports sunk, and 4 destroyers (which arrived later) severely damaged. The idea that Truk was impregnable was exploded.

As Admiral Hara, the Japanese Commander of Truk, said after the War was over, " I heard radio broadcasts from the United States describing Truk as an impregnable bastion. We could not help but laugh at this, knowing how weak we really were. I had South Sea blues for fear that you would find out the truth."

Eniwetok in the Marshalls was attacked on 17th February, 1944. The force, which was heavily supported by the navy, consisted of two reinforced amphibious regiments, one army and the other marine. A battery of DUKWS and two companies of tanks went with them.

The Allies used the same methods of attack as they had employed at Kwajalein and, in spite of a stout resistance put up by the enemy, Eniwetok was captured in four days. Allied losses were 700 killed and wounded, and of the 3,400 enemy who defended the island 3,300 were killed. The airfield was repaired and in full use by Allied aircraft by the end of a week.

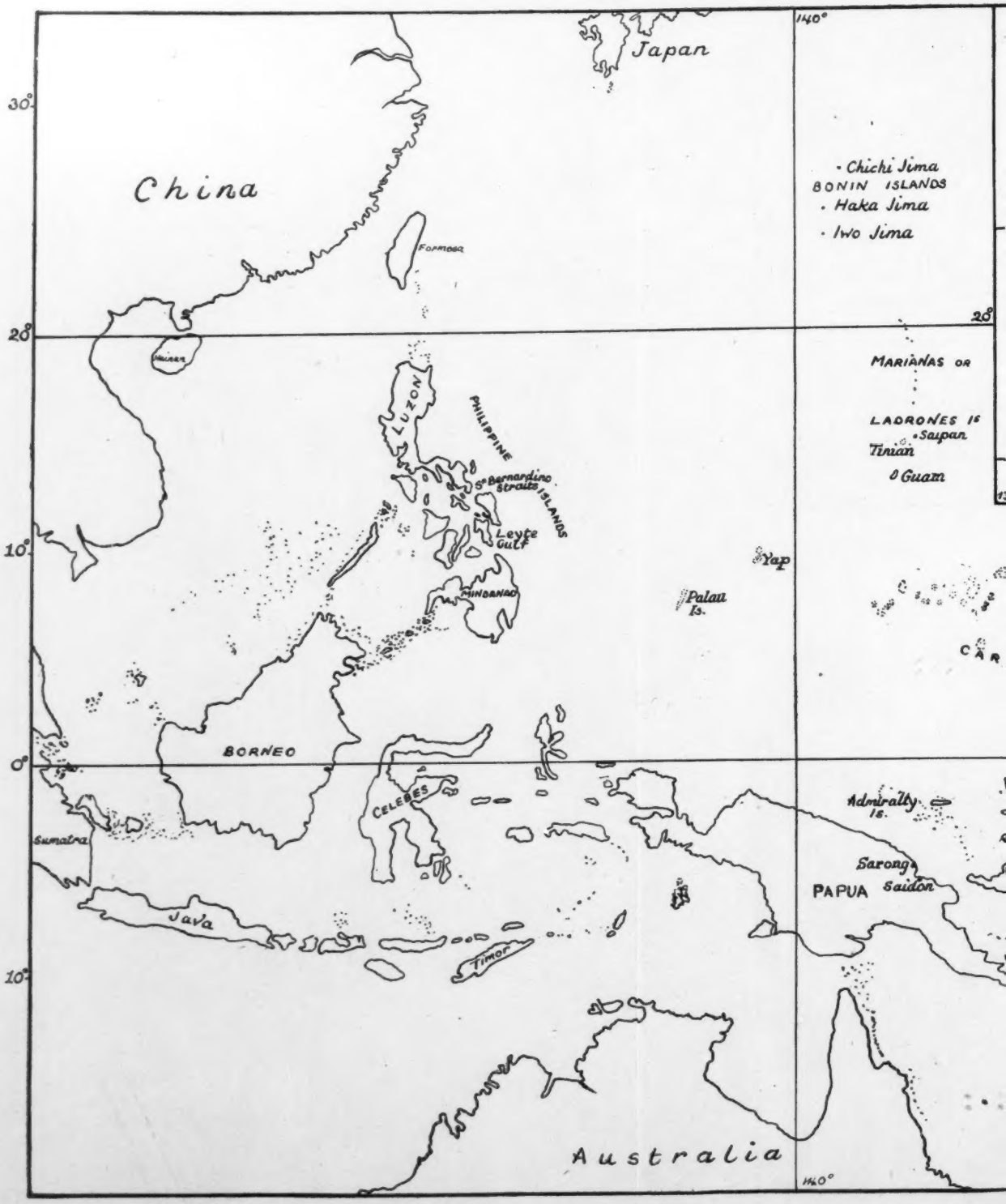
Four days after the attack on Eniwetok, Parry island—a few miles to the North in the same atoll, was also attacked and captured. In this attack, the smoke from

the bombardment was blown over the advancing landing craft and obscured them from their fire support ships. These continued firing, but owing to the bad visibility, they hit three of their own landing craft, and caused about 60 casualties.

The Gilbert-Marshall Island campaign, which had started in August 1943, had now been brought to a successful conclusion. Carrier-borne aircraft and amphibious forces had broken through the Japanese defence perimeter. The American strategic position had been greatly improved. Japanese air power East of the Marianas had been destroyed and their fleet had been driven out of Truk to the extreme West of the Carolines—to Palau. The Allies had also been able to establish at least three large fleet anchorages and twenty airfields, which would form the jumping off places for advances further to the West, and so nearer to Japan.

NOTE

Part II of this article dealing with the further American advance via New Guinea, the Western Carolines, and the Marianas, to the Philippines, will appear in next quarter's JOURNAL.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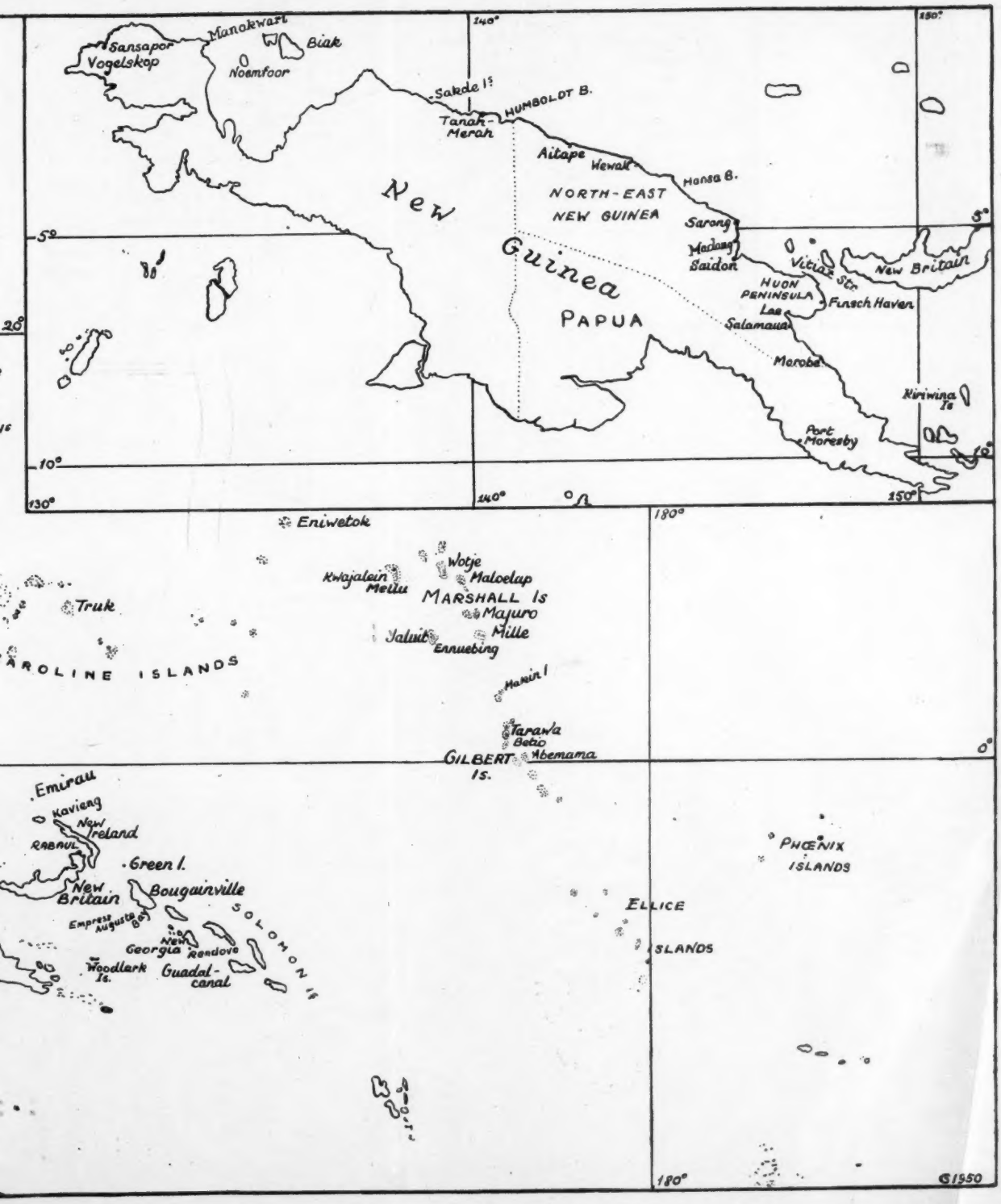
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ANZIO AND ITS LESSONS

By Colonel G. R. D. Fitzpatrick, D.S.O., M.B.E., M.C.

IT seems to be the way of things that major military defeats are extolled and examined in minute detail, whilst less sensational failures escape attention. Possibly this accounts for the lack of published comment on the Anzio landing, although operations of this sort are intensely interesting and often provide valuable lessons. Certainly there can be little doubt that it was a failure; indeed it only narrowly escaped being a major military disaster. The expedition was launched against the enemy's rear with the hope that its arrival would cause him to stampede from his main position: it was envisaged that the main body would join up within a matter of days or weeks. In fact the Anzio force was isolated for four months during which time the British and American casualties numbered 30,000.

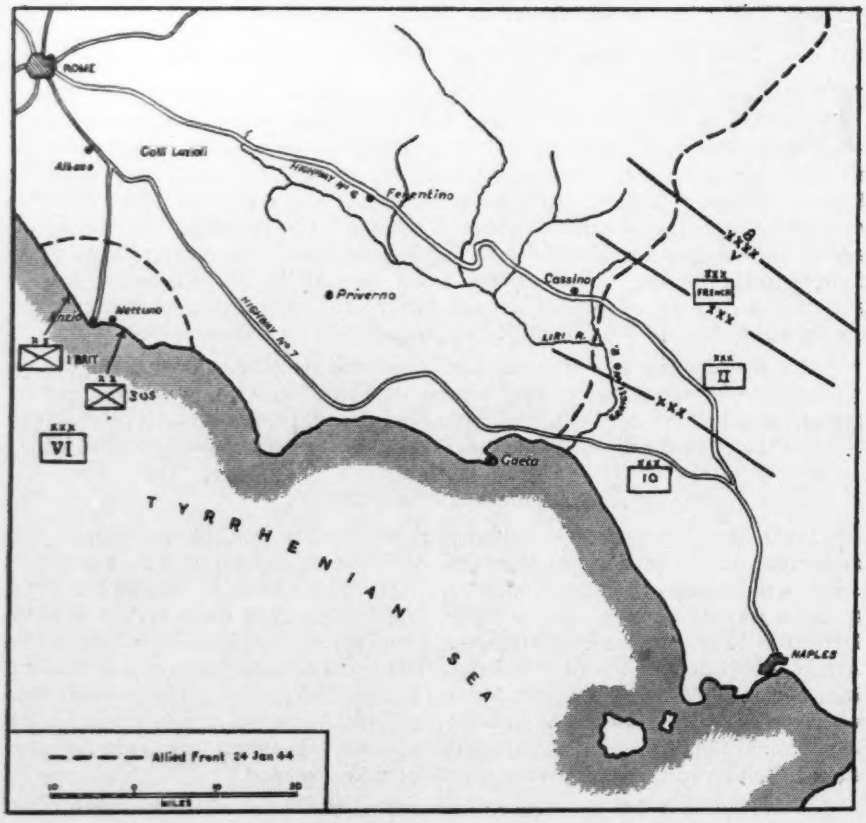
It is the intention of this article to examine the planning of this operation and if possible to determine the causes of failure. The broad strategic concept of an early capture of Rome will not be discussed; indeed it would be presumptuous to do so. Nor will the tactical actions of the actual battles in the bridgehead be considered.

The Original Plan

In October, 1943, it was decided that an effective way of maintaining the momentum of the advance on Rome was to despatch a seaborne force round the enemy's right flank. The availability of landing craft limited the size of this force to one reinforced division, and the latest date for launching the operation to 20th December. The plan was closely related to the operations of both Fifth and Eighth Armies. Eighth was due to attack first. The amphibious attack was not to be launched until the main body of Fifth Army had reached the line Priverno–Ferentino, when the one division was to be landed at, or near, Anzio and establish itself on the high ground Colli Laziali, dominating the enemy's communications. The distance from Ferentino to the high ground is only 27 miles by road.

It will be noted that the distinctive characteristics of this plan were, firstly, that the launching of the amphibious outflanking operation was to be contingent upon the successful advance of the main body of Fifth Army; and, secondly, that the detached force would be operating sufficiently close to the main body to ensure that the enemy could not react to this threat without detriment to his main defensive effort. At this time it was envisaged that the enemy would not make any real attempt to stabilise the front South of Rome.

On 1st December, Fifth Army's main attack was put in, but by 10th December it had become apparent that the enemy had no intention of continuing his steady withdrawal and that heavy fighting would be necessary to secure the entrance to the Liri valley, let alone to advance up the valley as far as Ferentino. On the southern end of the front the flooded Garigliano constituted a formidable obstacle. It was thus clear that the Anzio plan could not be implemented on 20th December, and, as sufficient landing craft could not be left in the Mediterranean theatre after that date, the plan was abandoned. Up to this time planning for the amphibious assault had been carried out by H.Q. Fifth Army. It is of interest to note that as early as 10th December, it was considered at H.Q. Fifth Army that a landing at Anzio by a larger force could be undertaken independently of the operations of the main body of the Army. There was of course no question of this project being put in hand at that time in view of the shortage of landing craft.



The Second Plan

Operations in the Italian theatre were given a new stimulus by Mr. Churchill at the "Christmas Day" conference at Carthage. It was here decided that every effort must be made to advance our front in Italy both to capture Rome and to obtain depth in front of the Foggia airfields. Fifth Army was to attack across the Garigliano and Rapido rivers and an amphibious assault was to be made at Anzio. Once again the Colli Laziali was to be the objective of this expedition. As the result of a further examination of the availability of landing craft the latest date of the assault was fixed at 20th January.

The composition of the assault force was as follows:—

H.Q. VI U.S. Corps
Corps troops
1 British Infantry Division, with one armoured regiment under command
3 U.S. Infantry Division, with one tank battalion under command
504 Parachute Infantry Regimental Combat Team (U.S.)
One Battalion of Rangers (U.S.)
One Special Service Brigade (Two British Commandos)

The integration of British and American forces at the Corps level is noteworthy. Never before had this been attempted, and subsequently, during the planning for operation Overlord, it was deemed to be impracticable because of the radical differences in the administrative systems employed by the two armies. Furthermore at that time the ignorance of the majority of British officers of American techniques was only equalled by that of the Americans of British methods. For excellent and varied staff reasons 1 British Division and 3 U.S. Division were most easily made available, but it has been said that Mr. Churchill himself had insisted that the British should be fully represented in such a hazardous and momentous operation. Nothwithstanding the difficulties, the planning and execution of the landing were carried out in the record time of twenty-two days and the landing went off without a major hitch. This in itself is one of the most remarkable features of the operation.

At this juncture it may be worth-while to consider the points of difference between the original and second plans. In the latter case the amphibious assault was to be launched whether or not the operations of the main body of Fifth Army succeeded, and thus there was a possibility, even a probability, that the expedition would be isolated for several weeks. On the other hand the size of the assault force had been doubled.

At an early stage in planning it was realized that provision must be made for seaborne maintenance for a possibly protracted period, and also for the lift of at least one follow-up formation. The Christmas plan had envisaged that the shipping and craft would only remain available for eight days after the assault. On 8th January, there was a further conference with Mr. Churchill where it was decided that additional landing ships could be retained until the end of February.

Throughout the planning period there was intense preoccupation at the higher levels with the question of availability of ships and craft. It was not just a question of postponing their return from the Mediterranean to the Home station, but also of commandeering ships en route home from the Far East.

In the meantime the detailed tactical plan of the assault was being developed by H.Q. VI Corps, the initial planning having been undertaken by the staff of Fifth Army. In fact there were few modifications of the Army plan except regarding the employment of the parachutists. At first it was intended that they should be dropped a few miles inland on to one of the early objectives of the assaulting infantry. However the risk of confusion was thought to be too great and eventually it was decided that they should be brought in by sea. The two British commandos were added to the order of battle quite late in the planning.

The plan provided for an assault landing by two brigade groups of 1 British Division, and by the commandos, on the very exposed beach to the West of Anzio; by the Rangers and one parachute battalion on a small beach very close to the port itself; and by the 3 U.S. Infantry Division, deploying all three regiments, on the main beach to the East of Nettuno. Subsequently the balance of 1 British Division, and Corps troops, were to be landed, whilst one R.C.T. of 45 U.S. Infantry Division and half 1 U.S. Armoured Division were designated for the follow-up.

Before the actual assault there was no detailed planning for the development of operations after the capture of the bridgehead, roughly an area enclosed by an arc of about 11 miles radius with its centre at Anzio. The Colli Laziali feature, however, was always regarded as the final objective. The omission of this stage of planning was not accidental.

The Assault and After

On 17th January, 10 Corps attacked across the Garigliano and met with limited success. A bridgehead was secured, but further progress was found to be impossible. Later, on 20th January, 11 Corps attacked across the Rapido and was almost immediately compelled to withdraw. Thus the attacks of the main body of Fifth Army showed little promise of success by 21st January, the day on which the Anzio force was due to sail.

The expedition had been mounted in the Naples group of ports and duly sailed on the morning of 21st January. After an uneventful voyage in wonderful weather the assault force arrived off the Anzio beaches during the night. The leading craft touched down at 2 a.m. on 22nd January, exactly on time. The opposition was negligible. Surprise had been complete. This last was due to the effectiveness of the Air Forces and the efficiency of the cover plan.

By 23rd January, both divisions had completed landing and the bridgehead, as planned, had been occupied. On 24th January, a carrier patrol from 24 Guards Brigade advanced to within three miles of Highway 7, took a few prisoners and withdrew. Nothing stronger than light reconnaissance patrols were allowed beyond the bridgehead perimeter: the tanks were retained in reserve to deal with the expected counter attack. On 25th January, 1 British Infantry Division attacked up the Albano Road and 3 U.S. Infantry Division attacked towards Cisterna. By now, however, the enemy had had three days in which to concentrate their troops and during which they had not been seriously molested by ground forces. The rate of enemy build-up had been astonishingly quick. It is estimated that by 24th January there were 40,000 enemy troops within striking distance of the bridgehead: by 29th January this number had been increased to 70,000.

It is since clear that, after the 24th January, there was no hope of reaching the objective without engaging in a major battle. It is equally clear that there was little opposition during the first two days.

The Lost Opportunity

It is very easy to say, "If only the commander had planned for the exploitation of his first success and had seized his opportunity, all would have been well." On the other hand it is far from easy to determine the precise influences which caused him to do otherwise. In attempting to do so there is a grave danger of over simplification. In practice a commander is influenced, not so much by a series of independent factors, but by the balance and interplay of all the factors which merge to form a general impression.

From the brief narrative of the background and planning of the operation it will be seen that the concept of its conduct developed considerably from the first October plan. In that plan one reinforced division was to be used to land and seize the Colli Laziali: there was to be no question of prolonged maintenance of an independent force, as the division would not be landed until a link-up by the main body could be achieved without undue delay. Similarly there was no question of a methodical process involving the capture of a bridgehead, followed by a build-up and a break-out. Speed was implicit in the whole project. Possibly because this was so obvious in the first case, the need for speed was not specifically stressed when formulating the aim of the final plan. This aim was the same as that of the first plan—to establish a force on the Colli Laziali feature which dominated the enemy's communications behind his forces opposing the main body of Fifth Army. Once

this feature was in our hands there was every hope that the enemy would be compelled to loosen his grip on his main defensive position. On the other hand a threat to this dominating feature was a less serious matter for the enemy, if he could occupy it first. He then would be established on the good ground, dominating the force which threatened him. Success would therefore most likely attend the side which could first occupy in strength the Colli Laziali feature.

It has been shown that in the second plan the amphibious force was to be launched independently of the success of the attacks by the main body, and indeed these attacks had not met with any marked success by 22nd January. In fact the VI Corps operation was to be a miniature invasion allowing time for the consolidation of the bridgehead and build-up, and incidentally, allowing time for the enemy to occupy the objective in strength.

There was no plan for the rapid exploitation of initial success. There are probably several reasons for this. Firstly it was believed that the enemy forces in the assault area were greater than they in fact were ; secondly the hazards of a Winter landing were so great that it would have been unwise to rely to any large extent on the landing plan ; and finally, the Headquarters of VI Corps had been involved in some very nasty situations on the Salerno beaches and thus the staff were pre-convinced that the landing would be heavily opposed.

One may wonder why higher Headquarters did not insist on exploitation planning. Doubtless there was a proper reluctance to interfere in the tactical battle ; also, as has been said, their staffs were thoroughly preoccupied with the important business of collecting shipping and craft.

On the other hand one must consider the attractions of deliberately consolidating the bridgehead before advancing inland. An amphibious force is most vulnerable to effective counter attack during the early stages of the landing before adequate reserves of troops, heavy weapons and ammunition have been brought ashore. Unless the force is well positioned to sustain this first counter attack it is in danger of complete destruction. Furthermore a Corps of two reinforced divisions is not a large force with which to make an incursion to a depth of 20 or 30 miles. After troops have been allocated for the close protection of the beaches and port, and for flank protection, little is left for the forefront of the battle. This is a strong argument for waiting for the build-up formations.

It must also be realized that very heavy air attacks had been made on the enemy communications to the North of Rome. Whilst no man can guarantee the success of an interdiction programme, there was every reason to believe that the enemy would find the greatest difficulty in moving reserves from the North. In this case he would only be able to react to the landing in the early stages by weakening his main defensive front. There was therefore a chance that the desired effect could be achieved without ever occupying the Colli Laziali feature.

It may be useful to examine whether or not there was ever any possibility of the expedition, as constituted, meeting with success. Here one is in the realm of pure guess-work, but it seems reasonable to assume that the chance of success would be conditioned by two factors—the degree of enemy resistance to the landing, and the rate of enemy build-up. In the light of events it is fair to say that even had there been some opposition to the landing, and had the enemy build-up been considerably slower than in fact it was, there was a good chance of success by the method actually adopted. As against that, with a complete lack of resistance to the initial landing,

but with a rapid enemy build-up, there may well have been a good chance of stampeding the enemy northwards from the main position, if the Colli Laziali had been occupied even by weak forces. There is little doubt that this could have been done during the first two days. It is probable that the columns which penetrated to the objective would have sustained very heavy casualties. However these would have been infinitely less than those ultimately suffered in the bridgehead and Liri valley battles.

The claim that the early arrival of small forces in the area of the objective would have caused a general withdrawal of the enemy is admittedly speculative and open to challenge. It is based on the actual initial reaction of the enemy on the morning of 22nd January, when there was considerable movement northwards, and on the almost invariable effect of troops operating in enemy rear areas. The general chaos and panic that can be caused by quite small detachments in this situation is well-known. It must be realized that the area of the bridgehead, although well in rear of the enemy front line was not in fact the enemy " rear area " ; that is to say it did not straddle his lines of communication, nor were any of his installations located within it. The bridgehead did constitute a threat to the enemy's " rear area," but it was completely overlooked and capable of being neutralised if time were allowed to the enemy to move his reserves.

Conclusions

To extract the broad lessons from the Anzio operation is admittedly an ambitious task. It is, however, believed that the four points which follow were critical at Anzio and are capable of a wider application.

1. In an offensive operation the factor of speed, which is the inverse of time, is usually of great importance. If the aim is to be fully defined it will often be necessary to specify the element of speed. In the case under discussion it would have been of advantage if the need for speed in capturing the objective had been consistently stressed.

2. An offensive operation should be planned in its entirety. The Commander should visualize clearly every phase of the battle. This is not to say that the later phases will be planned in the same detail as the assault itself, but it is imperative that preoccupation with this phase should not preclude all thought for what will follow. When planning the subsequent phases every reasonable contingency should be foreseen—even unexpected success.

3. A Commander must always be prepared to exploit success even if it has not been foreseen, and even if it occurs during the early phase of a carefully planned operation.

4. The integration of British and American forces on the Corps level is by no means impracticable. In this operation it was in no way responsible for any major shortcoming, although the landing took place during the infancy of Anglo-American co-operation in the field.

THE DESTRUCTION OF ZEPPELIN L.15

AN EARLY A.A. SUCCESS

By BRIGADIER H. B. LATHAM

TO those who can compare the bombing of London in 1915–16 with the "Blitz" of 1940–41, the former may appear as a relatively minor incident, but the means then adopted for air attack and defence were novel, and the lessons learnt stood us in good stead twenty-five years later.

The Zeppelin L.15 was not the first to be shot down by gunfire, or by an airman, but she was the first to be destroyed over the British Isles. She was shot down by gunfire on the night of 31st March/1st April, 1916. Other notable successes achieved during 1916 were :—

S.L.11 ... Shot down by Lieutenant W. Leefe Robinson, V.C., R.F.C., over Cuffley on the night of 2nd/3rd September.

L.32 ... Shot down by Lieutenant F. Sowrey, R.F.C., over Billericay on the night of 23rd/24th September.

L.33 ... Shot down by gunfire at Wigborough also on the night of 23rd/24th September.

L.31 ... Shot down by 2nd Lieutenant W. J. Tempest, R.F.C., over Potter's Bar on the night of 1st/2nd October.

In September, 1914, Home Air Defence was in the hands of the Admiralty, who were not slow to adopt an offensive policy : the German air bases were to be attacked from our own in Belgium ; the raiders were to be intercepted by aircraft from our East Coast airfields ; anti-aircraft guns were to be sited to guard points of military importance, but for the moment the defence of London and the other large towns was to be a passive one.

With the means then available even this policy proved hard to implement. Our aircraft, with their limited range, were unable seriously to interfere with the German installations then supporting the attack on England. With little or no early warning system it was found impossible to intercept the raiders and, since the attacks were usually made under cover of darkness, our airmen suffered considerable casualties without any compensating reward in operating from ill-lit landing grounds.

At the start, therefore, the main defence was the A.A. gun. There were few of them and many were ill-suited to the task ; but as more and more were put to this service, the Admiralty found it impossible to man them and had to call on the War Office to do so. On the passive side, the lighting of London and the larger cities was gradually restricted as the raids increased in intensity till a general "black out" prevailed.

The Germans had been developing airships for some years before the War, and between 1906 and 1918, one hundred and twenty-three were built and operated by the German Naval and Military Air Services, but in 1914 their potentialities were over-estimated. In general outline they remained the same throughout the war years, being approximately 540 ft. long, with a beam of about 60 ft. They had a cruising speed of 40–60 m.p.h. ; a ceiling of 9,000 to 12,000 ft., and they carried a bomb load of about 1½ tons, half of which was usually incendiaries.

They were hard to control in adverse weather conditions and difficult to navigate accurately. The reports of many of their commanders show that they had little

idea of the real course they had pursued over a " blacked out " Britain, or of the areas they had, in fact, bombed. Yet in July, 1915, when the Kaiser sanctioned the bombing of the City of London, he naively directed that buildings of such historic interest as St. Pauls should be spared. In practice, whatever the commanders of the Zeppelins thought they were doing, those below soon realized that the bombing was entirely indiscriminate.

Early in 1915, the German Airship Services had perfected their arrangements, and on 9th January permission was given to bomb military objectives in England. On the night of 19th/20th January the raids began. Between this date and the end of the War, 72 raids were delivered, killing 833 persons, injuring 2,002, and causing more than two million pounds worth of damage.

The first nine raids delivered after the start of the Zeppelin bombing offensive were largely ineffective, but as more airships became available, the number engaged in each raid was increased and the tale of casualties and damage mounted. On 6th June, 1915, Hull suffered severely and on 15th June the Tyneside was attacked effectively. The first concerted attack on London was ordered for 9th August, but weather conditions prevented the raiders from reaching their objective, and it was the Humber area which suffered.

The first raid on the City of London took place on the night of 8th/9th September, when Mathy in L.13, caused widespread destruction on the general line Euston–Liverpool Street, and this was repeated on the 13th/14th October, when Breithaupt in L.15, on her maiden voyage, bombed the area between Charing Cross and Limehouse.

But by the end of 1915 the defences had begun to take shape. A simple system of ground observation posts had been established to give early warning of the raider's approach; the training of pilots in night fighting had been undertaken and the lighting of airfields improved. Many more searchlights had been installed, not only to enable the guns to engage but also to assist the night fighter in the pursuit of his quarry. The orders placed by the Ministry of Munitions for new anti-aircraft guns of an improved design were coming to fruition, but those controlling their fire still had no instruments to assist them. The actual engagement of the target was carried out " by guess and by God," but practice and experience had sharpened the knowledge of those in command of the guns, which now began to hit.

The division of responsibility between the Admiralty and the War Office had not proved entirely satisfactory. In the Autumn of 1915, therefore, discussions took place between these two Departments when it was agreed that in general the latter should take over the responsibility for dealing with all enemy aircraft which crossed our coast, whilst the former engaged them over the sea. This policy was ratified by the War Committee of the Cabinet on 10th February, 1916, and on 16th February, Field-Marshal Lord French, as G.O.C.-in-C. Home Forces, shouldered this extra burden.

At that time 65 guns were mounted for the defence of the capital, but not all of them could be classified as efficient anti-aircraft weapons. Included in this total were 1 pdr. pom-poms; 13 pdrs.; 3 in. 5 cwt.[1], as well as the new 3 in. 20 cwt. A.A. guns which were now being delivered by the factories.

The men manning the defences were equally mixed. Few had had experience of handling A.A. guns and they were drawn from Territorial Field and Garrison units of

[1] The 13 pdr.—with the recoil cylinder below the cradle.

the Royal Artillery as well as from the Regular branches of the Regiment. Some of the officers and N.C.O.s had received short courses of instruction at the School of Artillery, Shoeburyness, but the majority took over their new equipment without any previous experience and made themselves proficient by hard work and drill on the actual gun sites.

On 31st January, 1916, Zeppelins attacked the Midlands. Among them was L.15, which caused considerable damage at Burton-on-Treat. On 5th March, two other airships set out for Scapa ; but when their cammanders realized that they could not get there, they bombed Hull again.

All these attacks were not made without loss, and by this date ten of the Zeppelins employed in the offensive against Britain had been destroyed by aircraft bombing, as the result of gunfire, or through bad weather over the North Sea ; but, as already mentioned, L.15 had the distinction of being the first to be destroyed over the British Isles. The following is an account of her end.

The End of Zeppelin L.15

On the evening of 31st March, 1916, the weather was ideal for the raiders. The sky was almost cloudless and the wind had fallen to a dead calm. At about 8 p.m. the five naval Zeppelins—L.13, L.14, L.15, L.16 and L.22 approached the East Coast.

L.22 had orders to attack the Humber and, after bombing Humberston and Cleethorpes, returned home. The other four were directed on London, but Mathy, in L.13, soon realized that he could not get sufficient height to do this effectively, so he turned off to try and bomb the explosive works at Stowmarket. Whilst engaged in this his airship was severely hit by gunfire, and she limped back to her base. With L.15 well in the lead, the other three airships steered on parallel courses for the capital. Whether or not it was due to them suddenly becoming aware of the fate which had overtaken L.15 is not known, but at about 11.45 p.m., when she was lying a disabled wreck in the Thames estuary, L.16 suddenly unloaded all her bombs on Bury St. Edmunds and went home, whilst L.14, then approaching Brentwood, turned to the North, though later she again made for London and, avoiding the defences, dropped a few bombs near Thames Haven before returning to Germany.

L.15, still commanded by Breithaupt, crossed the coast at Dunwich and passing over Ipswich, Colchester and Danbury approached the Thames at Grays flying at 40 m.p.h. at a height of 11,000 ft. On her way she was engaged by the 6 pdrs. at Thames Haven, Kynochstown and Pitsea but, so far, suffered no harm. At about 9.30 p.m., Breithaupt turned his airship to the West to follow the course o the Thames to London, and as he did so was attacked by an aircraft piloted by 2nd Lieutenant C. A. Ridley, R.F.C., but evaded him in the darkness. Five minutes later she was picked up by the Perry Street searchlight[a] and the Brent gun opened fire. At the height at which she was then flying, she was not easy to hit, but the 3 in. 20 cwt. guns rose nobly to the occasion. She was soon held in the beams of five more searchlights, and engaged by the guns at Purfleet, Erith, Abbey Wood, Southern Outfall, Plumstead Common and Plumstead Marsh.

Still she continued on her way, and to those watching the action it seemed that nothing would stop her, for they were convinced she had been hit several times. Over Wennington Marshes, however, she received two hits almost simultaneously in

[a] The N.C.O. who was in charge of this light states that when he received the order to uncover the light, the beam by pure chance illuminated the bows of L.15.

the stern and the sudden escape of gas caused her bow to rise sharply so that for a moment she stood up nearly vertically. Her crew soon managed to regain control of her, and to allow himself time to ascertain the extent of her injuries and to avoid the bombardment, Breithaupt turned to the North, towards Rainham. But by now, owing to loss of gas, she was only flying at about 8,000 ft., and as she crossed the Rainham–Wennington road at 9.45 p.m. she received her final and crippling hit from the Purfleet gun, which burst three of her main balloons amidships. She sheered off into the darkness of the North-East, a falling and badly winged bird.

When he realized the full extent of the damage which his airship had suffered, Breithaupt knew that there was little chance of her reaching Germany again by the most direct route, so he decided to make for an airship base in Belgium, and when West of Ingatestone turned in that direction. As he did so, at about 9.55 p.m., he was most gallantly attacked by 2nd Lieutenant A. de B. Brandon—a young New Zealander, flying a B.E.2c aircraft, who dropped explosive darts on her from above and poured machine-gun fire into her from below, but with no apparent result.

At 10.35 p.m., L.15 arrived over Foulness. She was then flying at only 2,000 ft., though her crew had jettisoned everything including her armament. Here Breithaupt manœuvred her for a few minutes before quitting the land, but soon afterwards her back broke and she fell into the sea—the first major victim of the improved defences and the new A.A. guns.

Breithaupt and his crew, with the exception of one man who was drowned, were rescued by a destroyer and armed trawlers which hurried to the scene, but all efforts to tow the wreck to the shore failed, and L.15 broke up and sank.

A Sequel

In the Autumn of 1915, after two heavy raids on the City, the Lord Mayor of London—Colonel Sir Charles Wakefield, offered a prize of £500 to the first person or persons who were instrumental in bringing down a Zeppelin over the British Isles. Since this had been given some prominence in the daily papers, it was well-known to all those manning the London and Thames defences. On 3rd April, therefore, the Officer Commanding the A.A. defences at Purfleet—Captain J. Harris, wrote to the Lord Mayor and claimed the prize on behalf of his unit.

Sir Charles Wakefield submitted this claim to the War Office for approval, but the authorities were at first doubtful if any unit of the Army could legally accept such a prize. A careful investigation by the G.O.C.-in-C. Home Forces followed and revealed additional aspects of the case for consideration. Whilst awarding two hits each to the gun sites at Purfleet, Erith and Abbey Wood, and commending the shooting of the 3 in. 20 cwt. gun at Southern Outfall, he pointed out that the whole action should be regarded as one in which each part of the defences had efficiently carried out their particular role. The success achieved was due to the concerted action of a team and not to the individual skill of any member of it.[8]

It was therefore agreed with Sir Charles Wakefield that he should present a medal commemorating the event to each officer and man engaged. Medal rolls were prepared by the units concerned and the prize of £500 was turned into 353 gold medals which were issued in November, 1916, just before Sir Charles Wakefield terminated his term of office as Lord Mayor.

The medal itself was a little larger than a two shilling piece and was struck by Messrs. Mappin and Webb. On the obverse it carried the arms of Sir Charles Wakefield

with the inscription "Presented by the Lord Mayor, Colonel Sir Charles Wakefield." On the reverse there is a representation of a 3 in. 20 cwt. gun with the inscription "L.15. Well hit. March 31st, April 1st, 1916" with the name of the recipient engraved above. It was not designed to be worn and its presentation by a member of the civil population to the armed forces of the Crown was not without precedent. In some ways it is analogous to the silver star issued by the Mayor of Kimberley to those who took part in that famous siege. But it commemorates a unique event and all those who won it can be justly proud of having thoroughly earned it.

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[3] At this time there were 27 guns in the London and Thames section, but only those mentioned below were engaged and even then some of them only fired a few rounds at extreme range. All the searchlights were manned by the London Electrical Engineers, R.E. (T.A.), with the exception of the one sited at Darenth which was manned by a detachment of the Tyne Electrical Engineers, R.E. (T.A.). The A.A. guns concerned were sited and manned as follows :—

Dartford (the Brent Gun)	One 3 in. 20 cwt.	Manned by	5 Coy., Cornwall R.G.A. (T.A.)
Purfleet	One 3 in. 20 cwt. Two pom-poms	,, ,,	3 Coy., Essex and Suffolk R.G.A. (T.A.)
Erith	Two 6 pdrs. ...	,, ,,	5 Coy., Cornwall R.G.A. (T.A.)
Abbey Wood (Lessness Abbey)	Two 3 in. 20 cwt.	,, ,,	Regular R.A.
Southern Outfall	One 3 in. 20 cwt. One 13 pdr.	,, ,,	2 Coy., Glamorgan R.G.A. (T.A.)
Plumstead Common ...	One 3 in. 20 cwt. One 13 pdr.	,, ,,	2 Coy., Glamorgan R.G.A. (T.A.)
Royal Arsenal Defences ...	One 3 in. 5 cwt. Two 6 pdrs. One pom-pom	,, ,,	Regular R.A. and Kent R.G.A. (T.A.)
North Woolwich	One 3 in. 5 cwt.	,, ,,	Regular R.A.

THE BRIGADE GROUP AND REGIMENTAL TRADITION

By "JUDAS"

IN his article on the grouping of Regiments "Silver Bugle" advocated wholehearted acceptance of the amalgamation of the regimental Group into one Brigade Group instead of the compromise outlook now prevalent, and the addition of a larger Brigade Group tradition, composed of those aspects of the various regimental traditions which could conveniently be amalgamated, to the separate regimental traditions.[1] The object of the present article is not to criticize his suggestions, with which the writer largely agrees in principle, but if possible to reinforce them. The present compromise is mainly due to popular susceptibilities on the subject of regimental tradition. "Silver Bugle" dealt cautiously with it in stating his belief that Brigade Group and regimental traditions could and should continue side by side. It is felt, however, that this whole question of regimental tradition in its present form now merits thorough examination, for any opposition to his suggestions is likely to be founded on it, as was that to the original creation of regimental Groups.

Regimental traditions have been built up mainly by three factors—territorial association, family connections and regimental history. It is the impossibility of restricting territorial association to previous recruiting areas that has caused the need for grouping. This, however, is no new aspect for regimental officers. Insistence on officers having County associations with County Regiments has long been abandoned (except possibly in Scottish Regiments, and there more for clan reasons) through a general shortage of officers. Certainly since the First World War southern English officers have frequently been commissioned into North Country regiments. It would probably be no exaggeration now to say that the regular officers of any English unit who have the same County associations as their men are well in the minority. Yet, as far as is known, this has never been held to have affected Regiments adversely. Nor has any territorial argument ever been advanced against the interchangeability of men within the Royal Regiment of Artillery or in corps, such as the R.A.S.C., R.A.O.C. and R.E.M.E. Therefore little evidence seems to exist to warrant the attaching of much importance to territorial association in the maintenance of regimental tradition once a nation has become mainly industrialized.

For a variety of reasons family connections with Regiments tend to become progressively scarcer in modern conditions. Smaller families, fewer individuals with private means, the disappearance of many special advantages including social, previously enjoyed by Army officers, and world-wide instability all tend to discourage sons from following their fathers' Army profession. In the absence of relevant statistics it is impossible to know how many officers and men of the Regular Army have family connections with their regiments, but it is not believed that the percentage can be high. In any case, in view of modern tendencies, it would seem most unwise to assume that regimental tradition can continue to receive substantial support from this factor.

The part that regimental history plays in maintaining regimental tradition is debatable. The British are not an imaginative race by nature and estimate the quality of commonsense highly. We tend to despise emotionalism. Therefore it does not seem probable that many officers or men can be inspired in war or peace by the exploits of their regimental ancestors, such as at Waterloo, during the Indian Mutiny

[1] See "The Infantry Group System" in the JOURNAL of February 1950, p. 114.

or in the Dardanelles. Most of them appear to concentrate in war in a highly praiseworthy manner on performing the job in hand at the moment in the most practical way. Therefore, though the teaching of any history is of value, it is doubted whether the teaching of regimental history has ever had the ability to instil the *esprit de corps* that is frequently ascribed to it.

Regiments are not unique in instilling *esprit de corps* into their members. The ships of the Royal Navy are periodically commissioned with fresh crews, and the squadrons of the Royal Air Force frequently receive new drafts. These men appear to give no less devotion to their new than to their previous units.[2] In every walk of life there is a tendency to revere institutions to which the individual has become used. It therefore seems possible that tradition is frequently confused with mere habit; that the insistence by more senior officers on regimental tradition may sometimes, though unconsciously, be at least partially caused by a nostalgic longing for their carefree subaltern days; and that their devotion to the Regiment would have been no less if they had joined it two, instead of two hundred, years after its formation. Few of us are free from this nostalgia as we get older, the cause of which is often difficult to isolate unless we are in the rare position of being able to test whether it is we, and not only the conditions, that have changed. In self defence perhaps we tend to hinge our past enjoyment on to something intangible and therefore still inviolate from the changed conditions, such as tradition. It is natural to do so, but such a practice does not facilitate a dispassionate consideration of present causes and effects.

There is plenty of other evidence, besides that mentioned by "Silver Bugle," to support the contention that opposition to re-organization is rarely more than transitory. Re-organizations in the Indian Army also met with stiff and general opposition which also passed as soon as individuals became accustomed to the new order. The balance of experience seems to show that any attempt to have the best of the old and new worlds is doomed to failure and that, if changes are required, the surgeon's knife hurts less in the long run than continued pin pricks.

The present system attempts on the one hand to build up the individual's devotion to one particular Regiment, and on the other to make him serve new masters with equal intensity on receipt of posting orders. These are incompatible, and must impose an unnecessary strain on both the loyalty of the individual and the sanctity of the Regiment. It is an axiom in every Public School that loyalty to the School must be greater than that to the House if the School and its Houses are to prosper. Surely there can be no question but that the whole is greater than the part, and that the Brigade Group is now greater than its battalions. But "Brigade Group" is not an appropriate expression, as a group is composed of separate entities, and a Brigade is an operational organization similarly composed. Let us therefore call it a "Regiment," the main function of which, however much people may wish to blind themselves to the contrary, it has now taken over in practice and has thereby made the old regimental organization superfluous.

There would be yet another advantage to complete adoption of this system. By present methods governing promotion, whereby an officer is removed from the regimental list on substantive promotion to colonel, officers are frequently faced with the conflicting claims of loyalty to the Regiment and their own careers. The

[2] See "Tradition in H.M. Ships—A Comparison with the Regimental System" in the JOURNAL of August 1944, p. 280.

suggested formation of a group of battalions into one Regiment, however, would provide regimental promotion up to and including at least the rank of Colonel—a rank to which the outstanding regimental officer should have every right to aspire at regimental duty. It would also remove the anomalous necessity for Colonels of Regiments. The important task of co-ordination should not have to rely on *sub judice* methods.

Furthermore, the suggested system is no revolutionary measure. Some Continental armies with a far greater military tradition, through their long land frontiers, than the British, whose tradition is mainly naval, have adopted it successfully for generations. As " Silver Bugle " pointed out, it is already in force in our own Army in the Guards. Any criticism might more reasonably be based on its extension being long overdue than on any revolutionary aspect.

It would be easy for criticism of the suggestion to rely mainly on personal opinions about the value of present regimental tradition. The problem, however, is one of facts and not of opinions. It is a fact that the regimental officer is in the unsettling position of having to serve in Regiments, to the traditions of which he owes no direct allegiance. It is a fact that control by one organization is more efficient than partial control by several. A falling off in numbers with county and family connections with their Regiments are, unless contrary evidence can be produced, facts, as is the lack of evidence of adverse effects of previous re-organizations. Only factual criticism could therefore be convincing. In short, regimental tradition has become an Army slogan. Can it be proved that this slogan is an exception to so many others in that it has not grown into a mere excuse, however well intentioned, to avoid further re-organization and mental re-adjustment ?

It is also worth considering whether an honest census of opinion could have been obtained when the grouping of Regiments was considered. Any individual who voted for this suggestion would have laid himself and his Regiment open to the charge of harbouring disloyalty. That is presumably why " Silver Bugle " writes under a pen name : it is certainly why this writer is doing so. Also it could hardly have been expected that senior officers could have concealed from their subordinates their own bias on a subject about which many felt so strongly. Therefore any opinions then given that claimed to be general are open to suspicion, and can hardly be accepted as proof that in modern Service conditions many of the more junior officers are, in fact, paying little more than obedient lip service to regimental tradition in its present form ; or that the previous opposition would have been general, as it appeared, to a complete re-organization instead of to an extremely unsatisfactory compromise.

Finally, it is emphasized that this article does not in any way constitute an attack on the value of the old regimental traditions during the period when troops did all regimental service with their own Regiments. Few could be more ready than the writer to admit and appreciate the value they then possessed. Tradition, however, is not an end in itself, but a means to an end ; it should guide, but not retard, progress. Without the modification of traditional habits and outlook no progress would be possible. Yet the only substantial objection to the conversion of Groups into Regiments appears to be the existence of regimental traditions in their present form. If this is correct, the objection seems unjustified. In any case, it is certain that no man can serve two masters indefinitely.

CHURCH PARADE

By Lieut.-Colonel M. C. A. Henniker, D.S.O., O.B.E., M.C., R.E.

WHY is the Garrison Church nearly empty? It is Sunday morning and the bells (produced by a loud hailer on the steeple and a gramophone in the vestry) ring out their merry peal. In the front pew on the right sit the Brigadier, his wife and two children. Behind him sits the Commanding Officer of one of the artillery regiments also with his wife and children. On the other side three officers, of I know not what regiments, occupy the third pew from the front. There are two or three civilians and about twenty soldiers: troopers, gunners, sappers and infantrymen. There are only two N.C.O.s visible, and my mind harks back to the last time I was here.

It was before the War. The church was full of sweating, shuffling soldiery, for it was hot and the march to church had been a long one. In those days there was a Church Parade every Sunday. The church was too small to hold the whole Garrison; so every unit had to contribute its quota. The quota varied with the size of the unit, but in R.E. units it worked out at one officer out of three and twenty men out of about seventy. Allowing for a few Roman Catholics and "fancy religions," I suppose we all had to go on Church Parade about once every three weeks.

Church Parade was a terrific display. Soldiers, it was said, toiled, polished and swore all Saturday afternoon and Sunday morning, so as to be certain of being clean and well turned out. Some said it was all most ungodly. Sunday, they said, was not a day of rest but a day of blasphemy. But in fact in a good unit—and in the British Army there are always many good units—most of the men had clean equipment hanging over their beds and a pair of trousers being pressed under the mattress every day of the week. On Sunday the good soldier merely had to wear them; and even if he were not a good soldier, and had no clean kit ready, a spirit of comradeship averted crisis. It was not difficult to borrow a clean belt and a well pressed jacket; every old soldier of pre-war vintage will tell you that. But I remember a Sunday when there was a very special Church Parade—perhaps it was Remembrance Day—and the Major and I were both on parade. He inspected the front rank and I the rear rank (threes had not been invented then). To my horror I saw a scarecrow: it was Sapper Murphy—a good hearted Irishman, but never addicted to brevity of speech. His hands barely showed below his cuffs and his hat almost covered his eyes.

The Major exploded: "Have you had your uniform inspected by the Captain?" he demanded.

"Yes Sorr," replied Sapper Murphy volubly. "He's inspected my uniform again and again, Sorr, and the tailor's altered it to the Captain's liking. But last night I fell off a bus, Sorr, and got covered with mud from the top of my head to my ankles; and I could never have come on parade, Sorr, only Sapper Williams lent me his uniform and he's just a bit bigger than I, Sorr."

The Major apparently had second sight. "All that's a damned lie," he said. "What you mean is that Sapper Williams drank too much last night to be fit for parade this morning and *you* hadn't got a clean tunic. So you came on parade to answer his name wearing his tunic and hat. Is that not so?"

"I'd never be telling you a lie, Sorr, but . . ." began Sapper Murphy; only the Major interrupted.

"Serjeant Major," he said turning to his henchman. "Send this sapper off

parade. He's a Roman Catholic anyway. See he goes to the R.C. parade next Sunday; and remind me to tell Father O'Ryan not to be too hard on him for absenting himself to-day."

I don't know what the upshot was; and I only quote the incident to show how in a good unit the rigours of Church Parade were mitigated by comradeship. It was perhaps not such an imposition after all.

And now my wandering mind is brought back to its proper place by the entry of the clergy and choir. The clergy are numerous, as it is a big garrison with many padres and only one church; but the choir is meagre. The service is taken from the Army Prayer Book, in which is appointed a special Order of Service for use in a Garrison Church. The Padre announces the page on which each part of the service is to be found. Thus: "Now let us sing the *Venite*, which you will find on page 2 of the Army Prayer Book." This would be an essential procedure in a compulsory service as many of the soldiers would not know where to find the *Venite* unless told; but I doubt whether in the present congregation it is necessary—most of them in church to-day look like regular church-going types. As a matter of fact they look, some of them, rather dim types. Why should this be? Where are all the hearties? They are reclining on their beds; "charping down" (from the Urdu *charpoi* a bed). Perhaps some are in the N.A.A.F.I. Club; a few are on cookhouse fatigues; and a few may be polishing their equipment for Monday; but most of them are in their barrack rooms reading the Sunday papers.

One of the results of an empty church is that the service is not a moving one. The circle may be magic or vicious. A good congregation fires the preacher to greater eloquence and the people are glad they came; conversely, an empty church depresses the preacher who speaks not well, and those present wish they had stayed at home.

What then can we do to get men to church? My own experience has not been very encouraging. When the War ended we were in Germany, and all my soldiers were in one camp with a church three hundred yards away. I was allotted a Padre—an enthusiastic little man with a strong Lancashire accent. He had a fine war record behind him, and he certainly "cut ice" with the soldiery. I told him he could count on my support in all that he did to encourage attendance at Church services. Various measures were taken to ensure that any man who wanted to go to church was not debarred by routine duties. The Padre first really interested the soldiers in his weekly 'Hour': a glorified scripture lesson, which brought to light the most incredible ignorance of the scriptures. It transpired for instance that very few men knew what was meant by the Trinity; one man suggesting quite seriously that it was God, Satan and The Virgin Mary. Next, the Padre had the time of the morning service displayed in large letters on a blackboard outside the door of the dining hall after Sunday breakfast, and often stood beside the notice to remind men personally and to urge the waverers. I also referred to the matter on several occasions when I had cause to talk to the soldiers collectively.

And what was the result? Out of a possible of over eight hundred men officially described as C. of E. the record attendance in church on a Sunday was eighty-four excluding officers. Yet a few months earlier, when the fighting was still on, the merest flutter of a surplice in the billets and a congregation was collected in a few minutes.

What then was the cause? One reason, of course, was the absence of fear. When an inscrutable Fate appears to decree whether Jones or Brown will be killed in the

battle to-day, neither Jones nor Brown is allergic to prayer. But when there is every prospect of both Jones and Brown being amongst those present at tea time the Church loses some of its appeal.

The remedy is, I suggest, to preach a little more " Hell-fire." I met a Scottish Padre with a regiment of Jocks in India who laid on the " Hell-fires " with a flame-thrower. He was a great success. He rivalled the Padre of which the following story is told.

A soldier in the congregation put a sweet in his mouth to suck it during the lesson. " Privut McNab," said the minister in sonorous Scottish accents, " What do ye mean, eating a jujoob while the worrd of God is being read ta ye ? "

Private McNab blushed, shuffled and blurted out, " Sorry, surr ; I did na ken . . ."

He was interrupted. " Privut McNab," thundered the minister ; " When ye are doon in the everr-lasting firres o' Hell, the Almighty Lord will look in His infinite merrcy upon ye from on high, and will say ' Jaimie McNab,' He'll say, ' Ye ken noo ! ' "

You may say that this is going a little too far. But it seems probable that Private McNab never sucked a sweet again in church ; and perhaps some of the same sort of words would prevent other soldiers from lying about on their beds during Divine Service. One cannot help feeling that Cromwell's soldiers were as frightened of Hell as they were eager for Heaven. Men, like donkeys, do best with a carrot in front and a whip behind. To-day the whip, in the form of " Hell-fires," is not there.

Another reason for staying in the barrack room is that many soldiers are afraid that, if they go to church, their comrades will laugh at them : they might be thought pious ; and whereas few would resent being thought wild, all would resent being thought tame. They appear to enjoy a church service on the few occasions that the whole regiment is present, which seems to corroborate this theory. Of course they all grumble ; but what soldier does not ? They sing lustily in church, and joke and laugh as soon as they are dismissed after the service. They can have their religion without being required to appear pious. They can almost indulge in righteous wrath.

A third reason for not going to church is laziness. Every morning during the week the soldier must rise early for his parades and his work. Although he gets a fair amount of spare time during the day, his peak load (to use an engineering expression) comes in the early morning. Consequently a Sunday, when he need not hurry, is a welcome change. To shave and put on his best clothes in order to go to church robs him of what he feels is legitimate leisure. It is easy to see his point of view, but one feels that the better type of man should rise superior to this—as indeed he would were it not for the other reasons named.

Such seem to me to be the reasons why the soldier does not go to church on Sundays. A plan I have not tried—I never thought of it while I was in a position to try it—was a service on Sunday evening. Civilian congregations are usually better on Sunday evenings than on Sunday mornings ; and it might be the same in the Army.

Recently, however, I have been able to see other people's efforts to get the soldiers to go to church. One idea is to have a mid-week service—on Wednesday morning. The soldiers parade at the usual time—say 8 a.m. Those who wish may fall out, but the remainder are marched to church for a short service. Very few men fall out ; none in fact other than the fancy religions, and not all of them. Here, most of the reasons which operate against Sunday attendance at church are absent.

The soldier is more likely to be laughed at if he falls out than if he attends; no extra work is required on his turn-out—it has to be correct for the parade; and he will have had to get up early anyway. So he goes to church.

Curiously enough very few officers, other than those actually on parade go to church on Wednesday mornings. On a Sunday morning they are usually better represented than the rank and file; but on a Wednesday it is the other way round. This is because the officers have to "contract *in*" on either occasion—Wednesday and Sunday. They naturally do it on Sunday when they have more time. The soldiers have to "contract *out*" on a Wednesday—which they do not do, and "contract *in*" on a Sunday—which also they do not do. The reasons here are similar and have little to do with religion. The officer goes on Sunday because it is easier than Wednesday. The soldier goes on Wednesday because it is easier than Sunday.

Should the Army worry its head about attendance at Church? Some will say: Let a church service be provided for those who like it and let no one worry if it is not attended. Clearly, this answer will not satisfy the officer with the evangelical mind of a missionary; nor will it satisfy the officer who, without being a missionary, is keen to train a good unit.

Let us examine the proposition from a purely material point of view. Everyone who has ever taken part in a battle will agree that large numbers of men find solace in religion. It comforts them and makes them more staunch and brave. The effect is the same as confidence in their weapons. We go to great pains to give them good weapons and to train them in their use; so that when battle comes the soldiers may be confident in their weapons and use them to good effect. But, as we see, religion in battle is a good weapon, too. Surely then it is only prudent to train the soldiers in its use? If you made rifle shooting voluntary, and provided neither an incentive to excel nor a penalty for failure, few men in peace-time would walk all the way to the ranges carrying a heavy rifle to learn to shoot. In war-time many would learn to shoot to save their lives, but not in peace-time. No one would dream of advocating voluntary rifle shooting only. So rifle shooting is compulsory and no one listens to the soldiers' grumbles.

Why then should anyone listen to his grumbles when he is made to go to church? Some say that church parade is undemocratic. That is rubbish—and irrelevant. But supposing it were important, the answer is easy to find. Church Parade is far more democratic than rifle shooting. In rifle shooting the rank and file have to carry and use rifles and clean them when they have finished. The officer carries a light pistol only. He borrows the trumpeter's rifle and shoots purely for fun, and if he shoots badly no one worries over much. But on a Church Parade nobody carries a heavy rifle, and the officer has to perform a more conspicuous role as well as march to church.

No, on purely material grounds a good case can be made for Church Parade. On religious grounds I claim no special knowledge; but I suspect that full churches are more acceptable to God than empty ones.

RUSSIA'S FOREIGN POLICY

THE LESSONS OF HISTORY

By LIEUTENANT-COMMANDER R. F. COLVILE, D.S.C., R.N.

RUSSIA'S historical method of expansion is both interesting and significant. Three major wars in each of which, from a military point of view, her very existence was at stake, have been the results of West European invasions—notably those of Napoleon and Hitler. Her own aggressions have been, in general, towards relatively limited objectives, and much of her apparent aggression has often in fact hidden expansion elsewhere ; for example the Crimean War focused European eyes on West Russia while in the East the Tsar Nicholas was exercising considerable and successful pressure on his Asiatic borders. With space in which to manœuvre, she has always been prepared to be patient. Her technique is to probe, expand until she comes up against something hard, contract a little, wait a while, dig round the obstruction or tunnel underneath it until she can conveniently isolate it, remove or bury it and then continue. Whenever possible, she has preferred to negotiate peace. She likes to reinforce success and by-pass failures. War as a weapon she wisely dislikes. Force she uses offensively only when resistance is likely to be slight. The Russo-Japanese war was to Russia a border war in which Admiral Alexeiev—her local Viceroy, had overreached himself. At the Treaty of Portsmouth she withdrew temporarily. Within fifty years, and with almost no direct warlike action against Japan, she recovered all she had ever lost and more besides.

Geographically, Russia is in a position to control the interior lines of the continents of Europe and Asia ; but economically she is not capable of providing and maintaining the great network of road, rail and air communications necessary to make this control strategically effective. The capital outlay and annual cost which it implies could only be met if she had a skilled, industrial, wealthy and therefore taxable population. Without such a social order, the expenditure would entail debasing the standard of living to an extent which would be politically dangerous. Napoleon, in bequeathing his road system, legal code and military reputation to France stretched her beyond her means (already lacking in resilience from the time of Louis XIV) and left her an impoverished nation. For a state to spend beyond its financial means is to build its defences upon sand : the gun is not an alternative to butter.

That she is aware of this Russia's history is an indication, and it may account for her tendency to eschew force until the walls of the fruit are soft and the centre ripe. Constantly she has used the world of the spirit, of ideas, and of religion as her field of influence, and adapted the creeds of the World to her own ends. If a Country in possession of territory which she covets is pagan, then she espouses the cause of the Christian minority ; if the See of Rome is in the ascendant she claims the representation of Byzantium ; to-day when materialism is fashionable, she preaches Communism as the creed of the people. Big movements involving faith usually emanate from the people in the form of a call for salvation for the under-dog : " the first shall be last and the last first " either to-day or hereafter, represents the original popular basis of the idea of universal comfort.

The easiest way for such doctrines to be spread is through the seaports. Seafaring nations tend to tolerance because they are aware of other lands, other traditions, other points of view ; the sailor tends to a liberal catholicity of mind, whilst innately conservative in his manner. To any illiberal government this attitude presents danger, and herein lies a difficulty which the Soviet regime appears to have

recognized. To assist her road-rail system she must use the river and coastal routes. If the Arctic passage could carry her merchandise she might transport it from one end of the Union of Soviet Republics to the other without endangering the minds of her sailors. Within her own ports she can to some extent isolate the foreigner and prevent contact with the potentially unfaithful. But should her sailors visit other Countries there is danger of contamination.

From this results an increased desire to throw Europe-Asia into a vast insularity, an enhancement to the traditional policy of growing towards the sea. Her merchant fleet must be primarily a coasting fleet, her Navy built mainly to defend her coasts and her coastwise shipping and to dominate her inland seas. But for all that she is aware of the power of ocean communications, and the need to deny them to an enemy. Her attitude towards the oceans is an isolationist one, but she still wishes to allow her friends access to her ports, so that trade may continue when the necessary safeguards against large scale contamination may be enforced. For herself the use of the ocean routes is limited.

Such a policy reflected in the Russian Navy would mean anti-aircraft and surface armaments for ships with limited endurance and shallow draught, especially in the Black Sea and Baltic; a large submarine fleet to harry the ocean communications and if possible deny them to the enemy; the development of sea and air coastal forces equipped with efficient torpedoes; and a well-developed, large supply and potential output of sea-mines.

History shows that Russia has a surprising capacity for long term planning, particularly the planning of a stroke elsewhere as she allows momentum in a resisted theatre to subside. The failure of the Berlin blockade while aggression in the Far East went on almost unopposed and unnoticed is typical of her methods. To find Russia slowing down in the Far East and mistress of the Persian oil fields would be equally typical. With the Mediterranean at present checked but the Pacific in her grasp, her next major strategical onslaught might well be the Indian Ocean. An enemy air or submarine base in the Persian Gulf would make the naval position of the Western Powers in that Ocean exceedingly difficult. Turkey would become more encircled, the Suez Canal closed, and the fortification of the Communist creed in the Indian sub-continent much facilitated.

The Indian Ocean appears singularly vulnerable. The inhabitants of its coasts are industrially undeveloped, and the only major Christian Power with territorial standing in its vicinity is the British Empire. There is no Indian Ocean Defence Organization such as those growing in the Atlantic and the Pacific; no potential unity of seafaring and commercial Powers as in the Mediterranean.[1] The military ability of the Arab League after the fiasco of its Jewish adventure is suspect; Persia has divided counsels, little modern military tradition, and most covetable oil wells. India and Pakistan are mutually unhappy in their independent harness. The paucity of our own military resources in this theatre can but encourage Russia to believe that the fruit is ripe for plucking.

It is unwise to believe that the inherent nature of a nation is changed by a creed (more often a nation fashions a creed in its own image): Russia is none-the-less Russian because it is Communist, and although in due course an Imperial Russia, unable to expand further, may lapse from success into decadence and then decay, we should study these historical facts and their implications.

[1] See "An Indian Ocean Pact," by Commander H. E. Felser Paine, R.N., in the JOURNAL of February, 1950, p. 70.

COMMUNISM AND ITS COUNTERACTION

By Wing Commander K. Slater, O.B.E., A.F.C., R.A.F.

THE strategy so consistently pursued by the U.S.S.R. is governed by the Marxist dogma of dialectical materialism; political tactics and diplomatic technique may vary but the ideological objective of World Communism remains unaltered. In opposing the Government of the Soviet Union on this issue, the Western Democracies have a threefold political aim which may be summarized as follows:—

(*a*) To contain Soviet expansion.

(*b*) To eliminate Communism as an international force.

(*c*) To secure universal acceptance of the Charter of Human Rights.

Accordingly the purpose of this article is to examine the political background of Russia and the nature of Communism, in order to determine the broad lines along which Western grand strategy should be developed.

The Political Background of Russia[1]

In sharp contrast to the more liberal traditions of Western civilization, Soviet Russia is ruled by a semi-deified dictator who exercises his power through a massive bureaucracy charged with legislative, administrative and judicial functions. The regime is upheld by the ruthless use of force applied through an elaborate secret police organization. Following the same principle, a vast army is kept in being to garrison the Country and to safeguard the regime from external threats. All these features are popularly associated with the Communist Party, but in fact they faithfully reflect Russian tradition throughout her history.

On the other hand, whilst Soviet Russia has many features in common with the Tsarist regime, it would be misleading to suggest that, in turning to Communism, the nation has done nothing more than exchange one form of tyranny for another. The Communist dictatorship has profoundly affected the whole Country. Astonishing progress has been achieved in making good the shortcomings of the Tsarist regime and its legacy of backwardness, poverty and economic weakness. Apart from the radical changes and developments in the national economic structure which have been wrought under successive Five Year Plans, great strides have been made towards solving the problem of illiteracy, whilst higher education has been made available to the majority of those capable of assimilating it. More significant still is the indoctrination of an entire generation from birth, in accordance with Marxist philosophy; the effect of this on the highly strung and emotional Russian temperament is incalculable.

For thirty years the Russian people have been subjected to what is probably the most ruthless oppression in history which has violated all the laws of conscience. Virtually enslaved to the State, millions have been sent to concentration camps never to return. Millions more have been forcibly uprooted from their homes and packed off to other parts of the U.S.S.R. in course of the mass regrouping of population dictated by the Kremlin planners. By way of compensation they have been reassured that they are on the road to the Communist millenium when the dictatorship will be relaxed, the State will wither away and Utopia will have arrived. To add

[1] The article on p. 477 of this Journal entitled "Russia's Foreign Policy" can appropriately be read in conjunction with this article.—Editor.

conviction to this assurance the Party has been able to point to the fact that, although it is little more than thirty years old, it now rules over nearly a third of the World's land surface and has a membership of tens of millions and the backing of hundreds of millions; in fact the spread of Communism has been one of the most spectacular phenomena of all time and, so far, almost every prediction of Marxism has come true.

Firm conviction in the infallibility of Marxist doctrine has accordingly been the governing factor in shaping Soviet foreign policy. Dedicated to the cause of World Communism, the Kremlin is confident that lasting co-operation with the capitalist countries is neither possible or desirable, and it is therefore actively concerned to promote chaos and instability in international affairs as a necessary prelude to a world revolution. Nevertheless, armed conflict is to be avoided for the present, since the Country still requires several years of peace in order to develop more fully its economic and military potential which is not yet equal to that of the West.

In the meantime, if the Free World should succeed in turning the tide of Communism, the disillusioning effect upon the Russian masses, so long denied the instinctive rights of man, might well prove disastrous. National morale is almost entirely dependent upon preserving the apparent infallibility of Marxist doctrine which is the mainspring of the Communist Party. At all costs the Kremlin must maintain the momentum of the Communist advance and consolidate its gains; hence it cannot afford to suffer a really serious political reverse, as for example, the defection of an important satellite to the Free World. Any such loss of prestige might fatally discredit the national ideology when jailers and prisoners alike would join to overthrow the false prophets of the Kremlin.

If, then, the tide of Communism can be turned and freedom restored to the satellite Countries, the emancipation of the Russian people may not be entirely beyond the bounds of possibility. After all Demosthenes said, " It is not possible to found lasting power upon injustice, perjury and treachery," and, so far, history has not proved him wrong. With this in mind, let us now examine the nature of Communism and the reasons for its spread.

COMMUNISM

Its Nature

By definition, Communism is the vesting of property in the community, each member working according to his capacity and receiving according to his needs. A similar concept of society has been practised for centuries by various monastic orders arising from the great World religions. Members of these communities have been able to set at nought the value of worldly goods and voluntarily surrender all rights of possession in favour of their community. However, this form of voluntary communism is essentially a by-product of spiritual experience.

Marxist philosophy, on the other hand, is based on the premise that: " Matter exists and the human mind exists, but there is no God, no mind higher than the human mind and no life after this. Accordingly the highest activity is human activity, not of the individual but of man in society, and the highest achievement is the evolution of a perfect form of human society beyond which its members need not look." The shallow nature of this philosophy has thus led its advocates to ignore the spiritual evolution which must precede the advent of a truly communal form of society, and to misconceive its materialistic achievement as the primary purpose of life.

In reality, of course, the vast majority of men are not spiritually disposed to surrender voluntarily their rights of possession and freedom to work as they will;

thus Communism can only be imposed by force. This fact is clearly recognized by Marxist doctrine which states that Communism must be brought about by violent revolution followed by a period of absolute dictatorship preceding the era of true Communism. However, Marx[3] offers no indication regarding the duration of this period of dictatorship and in the U.S.S.R., as we know, it has already lasted for more than thirty years, where indeed it is more ruthless now than ever before. The danger here is obvious. The theory of " dictatorship by the proletariat " in practice concentrates absolute power in the hands of a small group of men at the head of the Party, who, to achieve their aim, must use this authority with complete ruthlessness. Inevitably despotism of this sort must evoke bitter antagonisms, the existence of which will make it impossible for those in control ever to relinquish power, even assuming they are prepared to do so. Hence the theoretically " transitional " period of dictatorship in practice becomes permanent. This explains the paradox of the Communist ideal which, in attempting to free mankind from want, succeeds only in enslaving him to the State.

Methods of Spreading

Contrary to popular belief, Communism is not simply the product of poverty and bad social conditions ; indeed very few members of the Party are recruited from the ranks of slum dwellers and those who have been most hard-hit by poverty and squalor. It is the middle-class intellectuals, professional workers, teachers and skilled artisans who form the bulk of Party members in every Country. These are the leaders who exploit social injustice to win the support of the masses, not with the object of relieving distress but in order to create the chaos which will lead to revolution.

Fired by fervent conviction and fanatical zeal, these people are prepared to make any sacrifice for the cause and will spare no effort to secure appointment to key posts in political and industrial organizations. Subject to no ethical considerations, other than the " good of the proletariat," they are quite ready to conceal their political allegiance in order to disguise their purpose. Hence, by ruthlessly applying this technique in every Country, they have succeeded in securing for their Party, a degree of power out of all proportion to its numerical strength. A measure of power having been achieved in this way, it is then relatively simple to enlist the unthinking support of the masses by preaching self-interest.

It is apparent therefore that the rapid spread of Communism is due, not to a spontaneous reaction by the proletariat, but to the fanatical conviction of middle-class intellectuals. What then has induced so many intelligent men and women to embrace Communism as a religion ?

For an explanation it is necessary to review the evolution of Western philosophy since the end of the Renaissance. Up to that time Western civilization was united in a single faith ; practically all Europe shared a common philosophy, common ideals and acknowledged a universally accepted code of ethics. National differences existed and sometimes led to war, but conflicts were never ideological. The era of common faith ended with the birth of individualism, which rejected the traditional teaching of the Church in favour of the new doctrine that men should believe according to the dictates of their conscience. The centuries which followed saw the establishment of a rapidly-increasing number of dissenting sects embracing a multiplicity of

[3] Karl Marx—the German author of the Communist text book *Das Kapital*.

doctrines. Eventually, confronted by a bewildering choice between conflicting beliefs, millions in every Country gradually abandoned the faith of their fathers and ceased to believe in anything at all.

The growth of this intellectual and spiritual vacuum has resulted in men becoming frustrated by the apparent purposelessness of modern life. Thinking men and women throughout the World are hungry for a cause and starving for lack of an ideal. To such people life seems pointless and dull and so, alive to social injustice, they turn to Communism which offers them a positive philosophy, an explanation of life, and a cause which they can serve. The success of the Communist appeal, therefore, lies not in the strength of its philosophy or in its political doctrine but in the reaction of the middle-class intelligentsia to agnosticism, social injustice and the intellectual chaos of individualism.

COUNTERACTION

In view of the implacably hostile attitude of the U.S.S.R. to free democracy, preventative war or cold war are virtually the only courses of action open to the Western Powers in the attainment of their threefold political aim. The possibility of prosecuting a successful preventative war can be discounted for all practical purposes. In the first place, since peace is the declared aim of the democracies, public opinion is unlikely to support a policy of preventative war. Moreover, it is exceedingly doubtful whether the manpower and resources of the democratic Countries could ever be organized to mount a sudden and decisive offensive, whereas the chaos resulting from prolonged hostilities would inevitably provide fresh breeding grounds for Communism or some other totalitarian creed.

Cold War Strategy

Preventative war being out of the question, the strategy of the Western Powers must necessarily be shaped and adapted to suit the technique of cold war. The far-reaching character of Western political aims demands a positive and progressive strategy, aimed initially at halting Russian aggression and stemming the spread of Communism. Once this has been achieved, every effort must be made to reach a working agreement with the Iron Curtain Countries on a " live and let live " basis, whilst endeavouring to re-awaken nationalist sentiments in these Countries by subversive means. When the opportune moment arrives, an all-out psychological offensive will have to be launched against the Communist Party itself, with the object of exposing the fallacy of its doctrine, discrediting its leaders and eliminating it as an international force. The strategic pattern to be followed in achieving these objectives, therefore, falls into three phases :—

(1) *The Defensive Phase*

The first step in halting Soviet expansion is to restore the military power of the free democracies in order to sustain a firm diplomacy and to provide an effective deterrent to further aggression. Nevertheless it is important that the need to rearm should not be allowed to interfere unduly with economic and social progress, since any such tendency would play into the hands of the enemy. It is imperative therefore that the military forces of all the democracies should be organized and equipped on the most economical basis possible. Much progress in this direction has already been made within the framework of the Atlantic Pact, but full integration of forces has yet to be achieved and this is essential if wasteful duplication of effort is to be eliminated.

Russia's enormous population enables her to maintain huge land forces in being without unduly straining her manpower resources. The existence of these vast armies compels the Western Powers to keep many more men in the field than they can readily afford. In these circumstances the possibility of recruiting German manpower to offset the numerical superiority of the Red Army cannot be indefinitely ignored. On the other hand, any move to rearm the Germans as a Power would jeopardise the political unity of the Atlantic Pact nations and drive the satellite Countries who were victims of Nazi aggression further into the arms of the Soviet Union. The solution therefore appears to lie in the formation of German infantry and anti-tank units to be integrated with other Allied land forces.

The security of Germany's neighbours could be guaranteed effectively by invoking the threat of Anglo-American air power. Under an appropriate peace treaty agreement, Germany would be informed that any attempt on her part to initiate the production of tanks, heavy artillery or military aircraft would be countered by a month's warning to evacuate the industrial area concerned, after which the factories involved would be destroyed by air action. An arrangement such as this would be comparable to the control without occupation formerly exercised by the R.A.F. in Irak and on the North West Frontier.

Just as the restoration of the military balance of power should deter naked aggression, so the development of economic prosperity will help to isolate the infection of Communism. The economic system of the Free World must therefore be overhauled with the object of re-casting it on a more rational basis. Exchange must be freed and individual nations must be enabled to balance their internal economy whilst preserving a reasonable standard of living. Above all, every effort must be made to eradicate the causes of social injustice in every Country, particularly in the Middle East and South-East Asia where, in certain Countries, radical reforms are long overdue.

Thirdly, public opinion must be thoroughly innoculated against Communist propaganda. Ignorance of the true character and purpose of Communism is a prime source of danger to the democratic cause. Relying upon this ignorance, Communist propaganda is always careful to avoid any attempt to describe just what Communist society means. Instead effective use is made of a host of catch phrases and meaningless clichés such as: "the classless society"; "the end of exploitation of man by man"; "the expropriation of the expropriators"—all of which are intended to suggest in the vaguest possible way what Communism will be like.

Propaganda intended for democratic consumption never refers to the absolute power of the State over the individual, nor is atheism mentioned as a natural and inseparable feature of the theory and ultimate practice of Communism; the fact that the family has no place in Communist society and that all parental rights in the rearing and education of children are absolutely denied is likewise concealed. By skilfully playing upon popular ignorance in this way, the Party is able to create the impression that Communism represents a noble, humanitarian ideal which merits the support of all men of goodwill. Only by universally exposing the fallacy of Communist philosophy and clearly representing the precise nature of its ultimate aims can the Free World be rendered immune to the influence of the Cominform.

The exposure of Communism must be accompanied by an energetic campaign aimed at restoring faith in the democratic way of life. Special attention must be paid to the training given in schools and youth organizations and, in particular, children and young people should be carefully grounded in basic theology and

philosophy. It is of little use teaching children how to read and write unless they are also given a sound basis of thought upon which to build up knowledge. The importance of indoctrinating children in materialistic philosophy has long been recognized by the Communist Party who have devoted tremendous efforts to this end. By way of contrast, it is of interest to note that the Roman Catholic Church places such importance upon the early training of children that, for centuries, they have uncompromisingly insisted upon their right to educate their children in their Church schools. In consolidating the Free World against Communism, therefore, the problem of youth education will have to be given a great deal more thought and attention than it has so far received.

(2) *The Holding Phase*

Russia and the Western Powers have succeeded in reaching a fairly smooth working agreement regarding the occupation of Austria; trade agreements have been negotiated between Poland and the United Kingdom and it is probable that similar agreements will also be reached between Czechoslovakia and other Western European nations. These are hopeful signs which indicate the strategy to be adopted once the tide of Communism has been halted.

By encouraging an atmosphere of "live and let live" in which trade relations can be developed, it should be possible to open up communications between the satellite Countries and the West, thus preparing the way for a psychological offensive later. Meanwhile, Western diplomacy should concentrate on arousing nationalist feeling in the satellites with the object of touching off further outbreaks of Titoism. Poland and Czechoslovakia should be particularly susceptible to this sort of propaganda. Poland is the traditional enemy of Russia and history has shown Polish nationalism to be unquenchable; moreover, in a Country which is ninety-five per cent. Roman Catholic, domination by an atheistic, foreign power is unlikely to last for ever. Czechoslovakia likewise has a large Roman Catholic majority and is bound to the West by strong cultural ties. Furthermore, her people have also enjoyed twenty years of enlightened democratic government. In both these Countries, therefore, powerful anti-communist sentiments exist which, properly exploited, might be transformed into a veritable powder magazine.

(3) *The Offensive Phase*

When public opinion in the Free World has been educated into adopting a solidly anti-Communist outlook, and as soon as Soviet influence in the satellite Countries has been effectively undermined, the time will have arrived to switch over to the offensive. When this stage is reached, the mass of people on the edge of the Iron Curtain will have had several years first-hand experience of Communist dictatorship and, in consequence, will have begun to appreciate the shortcomings of Marxist theories in practice. They will have discovered that they are virtually enslaved to the State and denied all freedom of thought, freedom of expression and freedom of worship. These three freedoms are the instinctive birthright of mankind, and their denial under any form of dictatorship constitutes the Achilles heel of the regime.

The immediate aim of the psychological offensive must therefore be to debunk Communist theories, to discredit Party leaders, and to drive home the sanity and manifest advantages of free democracy. The mounting of this offensive will involve several years of the most careful planning and preparation. It is useless to launch it on anything but the largest scale, and this entails training leaders and key staff

officers, setting up a secure system of communications, and organizing a vast underground movement, all of which takes time and money. However, the issues at stake are vital and, given bold and resolute action at the opportune moment, there is a good chance of bringing about the downfall of the regime in one or other of the satellites. Skilfully exploited, such a success might initiate a chain reaction which, in course of time, might eliminate Communism from the face of the Earth.

CONCLUSION

Fundamentally the conflict between the U.S.S.R. and the West is an ideological one: it is a struggle for the minds of men. The real threat of Communism lies in the strength of its appeal to the middle-class intelligentsia by virtue of its claims to answer primary questions regarding the purpose of life. These are questions which contemporary Western thought has tended to neglect, despite the fact that the whole concept of freedom and democracy has its roots in theistic philosophy.

The ultimate success of Western strategy therefore depends, not so much upon building up political, economic and military power, important though this is, but in exposing the fallacy of Communism and in reawakening a militant faith in the ethics of human liberty. As De Tocqueville put it, "Despotism may govern without faith, but Liberty cannot."

THE WAR IN KOREA

EARLY on 25th June, Forces from the Communist territory of North Korea crossed into the territory of the Republic of Korea (South Korea) at a number of points and landed detachments on the East coast of that Country.

Later on the same day, the Security Council of the United Nations Organization called for an immediate cessation of hostilities and for North Korea to withdraw its armed Forces to the 38th Parallel.

On 27th June President Truman, in view of the Security Council's request, and the fact that the North Korean Forces had pressed on instead of withdrawing, ordered the United States Navy and Air Force to give the South Korean troops cover and support. He announced at the same time that the United States 7th Fleet would prevent any attack on Formosa, and that the American Forces in the Philippines would be strengthened. General MacArthur was, at the same time, entrusted with the command of United States Forces in the whole area.

In the House of Commons on the evening of 27th June, the Prime Minister informed the House that Great Britain had decided to support a resolution at a meeting of the Security Council recommending that members of the United Nations should furnish such assistance to South Korea as might be necessary to repel an armed attack.

On 28th June, Mr. Attlee announced that, in response to the resolution of the Security Council calling on all members of the United Nations to furnish assistance to the Republic of Korea, British Naval Forces in Japanese waters would be placed at the disposal of the United States authorities.

On 29th June, it was announced that Australia and New Zealand had offered to make certain naval units available. On the same day the Soviet Government, in a Note to the United States Ambassador in Washington, declared that events in Korea had been provoked by South Korean troops on the border.

On 30th June, it was announced from the White House that General MacArthur had been authorized to use certain supporting ground troops, that a naval blockade of the entire Korean coast had been ordered, and that the United States Air Force would now be allowed to conduct missions on specific targets in North Korea, wherever militarily necessary.

By 2nd July American troops had arrived in Korea and, on 3rd July, it was announced that the Australian Government had issued instructions for the 77th Fighter Squadron, R.A.A.F., in Japan to be made available for action in South Korea, in addition to H.M.A.S. " Bataan " and " Shoalhaven." Meanwhile British and United States warships had engaged six North Korean motor torpedo boats and sunk five of them. Also on 3rd July, the United States Defence Department announced that Marines and Marine air units were being sent to Japan as reinforcements, and that additional bombers would be sent to advanced American bases in the Pacific. About forty Countries had by this date expressed approval—although in a few cases qualified—of the Security Council's action.

By 4th July Mr. Gromyko—the Russian Deputy Foreign Minister, had denounced the Security Council's action as illegal on the grounds of the vote of the Chinese Nationalist member and the absence of the Soviet representative, and he also alleged that the Council had submitted to pressure from the United States. In addition he denounced the American intervention in the Korean " civil war."

On 5th July, Parliament gave full support to the British Government's policy on Korea. North Korean Forces began a frontal attack on the Suwon line, which included United States troops among the defenders. A British and American carrier force launched successful air attacks on targets in North Korea.

Reports dated 6th July indicated that the North Koreans had captured Pyongtaek and Chonan, 23 and 37 miles respectively South of Suwon. It was also announced that up to date only half a battalion of American troops and a few guns, which had been sent forward to stem tank columns, had been in contact with the North Koreans; this small force had had to withdraw after disabling several tanks by direct artillery fire. American air attacks on North Korea continued but poor flying conditions limited the number of sorties.

On 7th July, it was reported that the United States Government had ordered conscription. The Security Council approved an Anglo-French proposal for the creation of a unified command under the United States of all forces made available to the United Nations for intervention in Korea. General MacArthur was appointed Commander-in-Chief and was authorized to use the United Nations flag at his discretion in the course of operations against North Korean Forces, concurrently with the national flags of the Countries involved. American tanks reached Korea on this date.

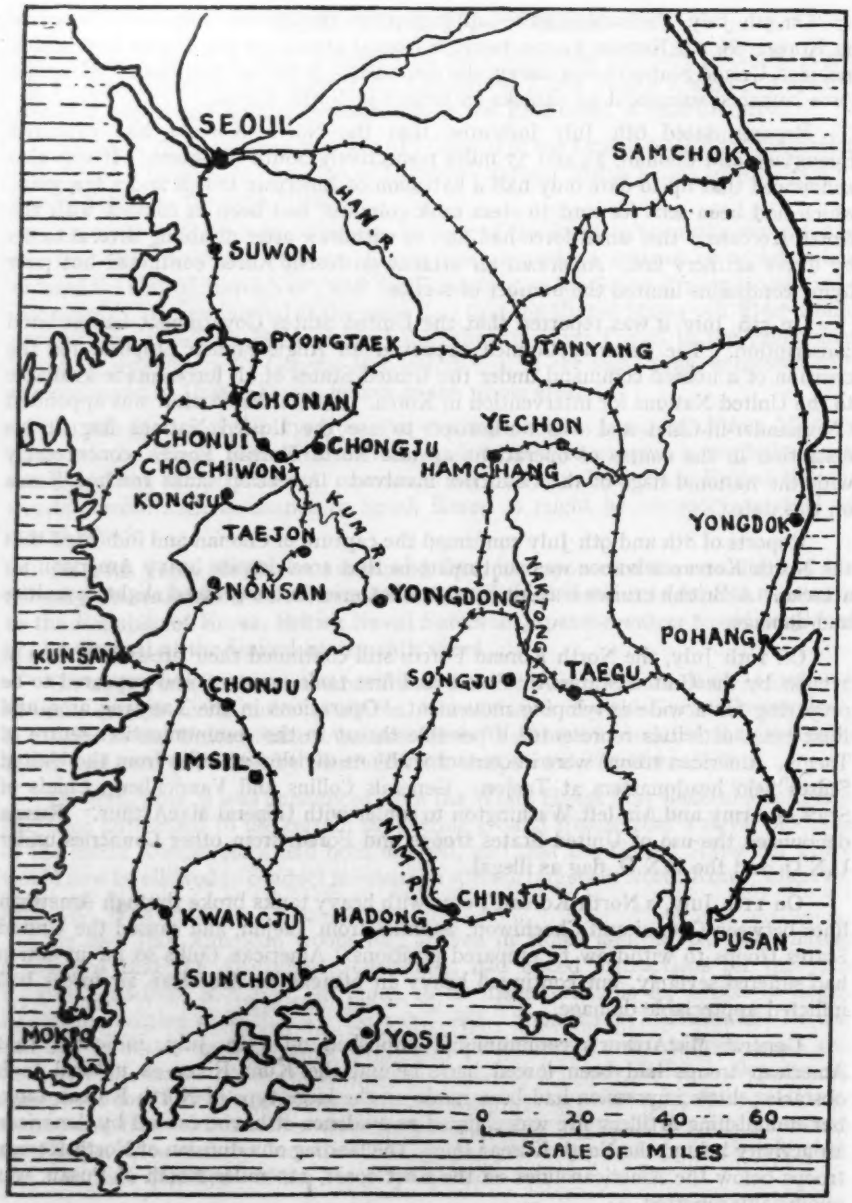
Reports of 8th and 9th July confirmed the capture of Chonan and indicated that the North Korean advance was continuing in that area despite heavy American air attacks. A British cruiser was hit by shore batteries and sustained slight casualties and damage.

On 10th July, the North Korean Forces still continued their pressure in face of attacks by the United States Air Forces and first tank counters, and appeared to be preparing for a wide enveloping movement. Operations in the Tanyang area and East coast activities represented a possible threat to the communication centre of Taegu. American troops were in contact with one division 20 miles from the United States field headquarters at Taejon. Generals Collins and Vandenberg, Chiefs of Staff of Army and Air, left Washington to confer with General MacArthur. Russia denounced the use of United States troops and Forces from other Countries under U.N.O. and the U.N.O. flag as illegal.

On 11th July, a North Korean Force with heavy tanks broke through American lines between Chonui and Chochiwon, 20 miles from Taejon, and caused the United States troops to withdraw to prepared positions. American tanks so far in action had suffered severely, but continued heavy air attacks by American air forces had inflicted appreciable damage.

General MacArthur's communiqué, published on 13th July, indicated that American troops had been forced back behind the Kum River—a natural tank obstacle; little impression had been made on the large type of North Korean tank, but diminishing artillery fire was claimed as evidence of havoc caused by American air activity behind the North Korean line. The landing of a division of North Korean troops below the American lines on the East coast, 110 miles North of Pusan, was unofficially reported.

It was announced from Tokyo on 13th July that Lieut.-General Walton H. Walker—Commander of United States 8th Army in Japan, had assumed command of the ground forces in Korea, and that Generals Collins and Vandenberg, United States Army and Air Force Chiefs of Staff, had arrived in Japan.



SOUTHERN KOREA

The night of 13th/14th July was described in reports as quiet in the American sector, though North Korean tanks and armoured cars had reached a point 15 miles South of Chongju towards the East side of the Kum River bend in front of Taejon.

Strengthening of North Korean troops on the East coast indicated a probable preparation for a thrust to the South. Fifty Superfortresses bombed a special target area in North Korea, and Australian and American aircraft were active.

Reports dated 15th July stated that North Korean troops had crossed the Kum River in the middle of the American defence position and that infantry fighting was in progress on the South bank. United States air forces were attacking the enemy bridgehead. Mr. Trygve Lie appealed to 52 member States of the United Nations for more assistance—particularly ground forces, in operations against the North Koreans.

On 17th July, it was stated that after two days severe fighting an American infantry regiment had been withdrawn from the Kum River to avoid being trapped by a flanking movement. General MacArthur announced on the evening of the 16th that the heaviest pressure was on the front East of the American positions, which indicated that the North Koreans were trying to divide the American and South Korean Forces.

United States troops in the Kongju–Taejon–Nonsan area were forced to withdraw to new positions on 17th July, and they abandoned the airfield three miles North of Taejon. On the same date it was reported that in the areas of Yechon and Yongdok in the East of South Korea, the North Koreans were in retreat after reversals at the hands of South Korean troops, supported by American fighters.

Reports of 18th July stated that the defending forces were holding all along the front, including the line just North of Taejon where the Americans had strengthened their defence. The South Koreans attacked the North Koreans in the centre and then withdrew to defence positions. Attacks by R.A.A.F. and American aircraft continued and it was thought contributed to slackening of the North Korean attempts to advance. That day, too, an American Division (1st Cavalry) with artillery and light tanks landed unopposed at Pohang on the East coast of Korea, and moved seven miles inland. A second Division (25th) was also put ashore on the 18th, but the locality was not stated.

President Truman in a message to Congress on 19th July asked for $10,000 million for the American Armed Forces, and said he would ask for further sums for military aid to the Atlantic Pact Powers and other Nations vital to American security. He also told Congress that he had authorized the Secretary of Defence to call up as many men as might be needed, and he asked for the statutory limits of the strength of the armed forces to be removed.

On 20th July, North Koreans attacked the American defenders of Taejon and lost seven tanks, destroyed by new 3.5 in. rocket launchers. Reports from Tokyo, dated 21st July, stated, however, that 24th American Division had withdrawn four miles from Taejon as, in addition to the North Korean direct attack, a flanking movement to the West, which included the capture of Chonju, threatened the left of the American position. The capture of Yechon, some 60 miles North-East of Taejon, by American troops was also announced on the 21st.

On 23rd July, a tank attack by North Koreans East of Taejon was repulsed. The enemy recaptured Yongdok on the East coast, while on the West they made a considerable advance and appeared to have reached as far South as Imsil; armoured spearheads were reported to have reached the Kwangju area. Troops of the American 1st Cavalry Division were reported as being deployed near Yongdong, while artillery of their 25th Division were credited with being in action in the Hamchang–Songju area. Guerilla activity had become more marked.

Two attacks by North Koreans along the Taejon–Yongdong road were driven off by American troops on 24th July. On the same date the occupation of Kwangju by Northern troops was confirmed with the additional information that light Northern forces had penetrated almost to the tip of the Western side of the peninsula—opposed by police only.

General MacArthur's first report to the Security Council, received on 25th July and taking events up to 18th July, stated that the large numbers of men and the equipment of the North Koreans showed that they had resources far in excess of their internal capabilities. He also listed eight North Korean divisions as being involved in the offensive. Reports from New York dated 25th July announced that the United States 1st Cavalry Division had given up Yongdong and had withdrawn to positions astride the railway to Kumchon, Taegu and Pusan. Elements of the 25th United States Division were reported to have assisted by taking advancing North Korean columns in the flank. On 25th July, Turkey announced her readiness to supply 4,500 armed men to assist the United Nations in Korea—a previous offer had been received from Siam to supply a small force.

On 26th July the Minister of Defence—Mr. Shinwell, stated that a self-contained British Force would be sent to Korea for use under the United Nations commander; that, in order to increase the crews of the Far Eastern Fleet, the Admiralty had been authorized to retain in the Royal Navy and Royal Marines some officers and men whose service would otherwise expire soon, and to recall some officers on the retired and emergency list, and men of the Royal Fleet Reserve; and that corresponding measures would be taken for the Army and R.A.F. if the situation made it necessary. On the same date Australia and New Zealand announced that each had decided to send volunteer ground forces to Korea. The composition of the Australian contingent would be dependant on Mr. Menzies' talks in Washington; New Zealand would probably send an artillery unit.

Reports dated 26th July from Korea and New York stated that the American forward positions were some distance South-East of Yongdong down the Taejon–Teagu road, and that elements of the North Korean 4th Division, which had been moving all over South-Western Korea and had lately turned Eastward, were checked for the first time at Hadong.

On 27th July, General MacArthur visited Korea and, after discussions with the Commanders, expressed his confidence as to future results. North Koreans were reported to be massing two divisions for an attack against the American centre, while South Korean troops with American air support drove the enemy back seven miles at Hamchang during the 26th. Ground was also gained near Yongdok. In the South-West, patrols moving westward from Chinju pushed North Korean elements back two miles in the vicinity of Hadong.

On 28th July, the North Koreans launched attacks all along the front after some hours of intensive artillery and mortar fire. The North Korean greatest concentration was reported to be in the West central area. General MacArthur stated early on 29th that the 1st Cavalry Division, South-East of Yongdong, was holding its positions in savage fighting after giving some ground.

Local counter attacks were launched by American troops in the 1st Cavalry Division area. Yongdok was successfully shelled by an American cruiser, and the Air Force on the fifth successive day of good flying weather bombed bridges, marshalling yards and other links of the North Korean communication centres. The situation in the South-West was said, by a Tokyo spokesman, to be completely

under control although Hadong was again in North Korean hands. Twelve North Korean supply boats bound for Inchon were sunk by South Korean naval units on 28th July. On the same date Washington reported that the total American casualties to date, in Korea, were 904 (76 killed, 8 died of wounds, 269 wounded, 79 injured and 472 missing). It was also announced from Washington that the United States Army was to increase its strength to 834,000—an increase of 247,000, and that it would spend an additional $1,652 million on new tanks, guns and other weapons.

By 30th July events had reached a critical stage. The North Koreans advancing eastwards after their drive down the West coast were reported to have captured Kochang and to be only a few miles West of Chinju. Two-thirds of the sorties made by the 5th Air Force on 29th July were directed on targets in the South-Western area—aircraft being hampered by bad weather. North Korean pressure on the rest of the front continued. Some 1,200 tons of bombs were dropped on enemy lines of communication on 30th July.

The North Koreans continued to press their Southern flanking movement during the day and captured Chinju, about 60 miles West of Pusan. The American 2nd Infantry Division, with supporting armour, disembarked at Pusan on 31st July.

THE INTERNATIONAL SITUATION

THE COMMUNIST WAR AGAINST THE FREE NATIONS

WAR has been defined as the means which, in the last resort, a nation uses to impose its will upon another nation. This ' means ' has hitherto been regarded as implying the use of armed forces at sea, on land and in the air ; but the struggle which is now taking place between Communism and Freedom is none-the-less war because the former is using propaganda, psychological and political pressure, intrigue and sabotage to wage it, even more extensively than open violence.

In last quarter's JOURNAL there were three articles foreshadowing " The Pattern of a Future War " and the course it might follow in the three elements. It is the purpose of this review to show the pattern of the present war as it is being fought under the supreme direction of the Russian Communist oligarchy. This pattern is being followed in many guises, but they can be grouped conveniently under two main headings :—

1. *The War of Infiltration*—generally alluded to as the Cold War.

2. *The War of Violent Aggression*, which the Communist supreme command is, as yet, waging by proxy.

THE WAR OF INFILTRATION

Communist infiltration follows a regular plan of psychological preparation leading to political domination. It is only if this form of aggression does not make satisfactory progress that the danger of wholesale violence—of war in its military sense—will arise, for the supreme planners are much too shrewd to risk the fate of their Nazi and Fascist forerunners by involving their own nation (and themselves) in the perils of future warfare, if they can avoid it.

The technique of the Communist psychological softening up process, in preparation for the political *coup*, has now been brought to a fine art. The various methods employed are well described in the article on " Communism and its Counteraction " in this JOURNAL.[1] The essence of it is first to undermine belief in democratic government, and to stir up discontent against the existing order of things whether political, economic, social or religious. When national coherence has been sufficiently disintegrated, social disturbance can be fomented. Under cover of this, Communist dictatorship (which has been well organized in fifth column fashion) gradually or suddenly—as may best suit circumstances—emerges. Without organized opposition, even by an anti-Communist majority, there is no effective resistance—and another satellite is enmeshed in the Russian constellation.

We can trace this process clearly in all the European States behind the Iron Curtain: freedom for their people has vanished in Poland, East Germany, Czechoslovakia, Hungary, Rumania and Bulgaria. Estonia, Latvia and Lithuania have ceased to have any semblance to independence and have disappeared completely into the Soviet maw.

The Communist plan has gone a bit awry in Yugoslavia where, despite acceptance of the ' true faith,' the patriotic leadership of Marshal Tito has led to refusal to sell her national soul. The result is that every kind of pressure, short of actual violence—so far—is being brought to bear on her to overthrow the existing government and ' come to heel.' This defaulting by what was planned to be another satellite state is all the more serious because it has led to an economic flirtation by Yugoslavia with

[1] See p. 479.

the Western Powers. It has also weakened the pressure on Greece, which at one time looked as if it might force her into the Communist camp. Nevertheless, it must not be assumed that Russia has accepted this as an impasse. The psychological war will continue relentlessly against and in those two Countries until the time seems ripe for political or military action. Albania remains a dutiful vassal state well placed strategically as a base for renewed aggression against her neighbours.

Going further afield, we see the softening up process of the War of Infiltration starting up in or against such widely separated Powers as Finland, Persia, Burma, Afghanistan, Siam and Indo-China. Moreover, whenever there is unrest—be it in our own or any other Country—there are the Communist agents fomenting and exploiting it as part of that process and of long-term planning.

Because the great majority of the peoples in the Free World are alive to the perils and horrors of Communism, that does not mean that they are exempt from the machinations of Moscow—far from it ; but different methods have to be employed to sow its seed. Abusive broadcasting with accusations of ' imperialism ' and ' war-mongering ' continues unabated, but it is probably kept going more for home consumption than with any idea that it will seriously influence the nations or their governments which it condemns. On the other hand, the most sinister and subtle use is being made of the two things most dear to those peoples—freedom and peace. Love of freedom is being exploited in the form of encouragement to throw off all forms of authority or restraint, even to the point of ignoring agreements freely entered into. Communist-inspired unofficial strikes, manufactured out of the most trivial disputes, are boosted as an expression of personal liberty, regardless of the harm they may do to the majority and, still more, to national prosperity. Communist agitators infiltrate Trade Union and shop steward organizations, or set up unofficial and independent committees with the object of creating trouble and so furthering the war against the very freedom they affect to advocate.

Even more insidious is the use which is being made of the Free Peoples' love of peace. Communist Russia, whose insatiable and fanatical aggressiveness is the great disturbing influence in the World to-day, has the effrontery to pose as the apostle of Peace. Peace campaigns, organized openly or clandestinely by the Kremlin, are recruiting big hearted and soft headed people, even among the freedom-loving nations, with the object of weakening those nations' defences and undermining their loyalty to each other. The abolition of the atom bomb is exploited by these Communist-inspired campaigns as being an essential step towards the preservation of World peace, or at any rate the prevention of the extreme horrors of a future war. It is carefully concealed from those asked to sign such petitions that it is Russia who is standing in the way of international agreement in this matter because her rulers will not subscribe to an effective international inspection of atomic sources and developments.

THE WAR OF VIOLENT AGGRESSION

As has been said, the Communist Supreme Command in the Kremlin is obviously disinclined to risk the reactions of the Russian people if they should find themselves committed to an ideological war when there was no real threat to their own hearths and homes. But Stalin and his Staff have no such qualms about waging war by proxy.

China

Their most resounding success in this direction up to date has, apparently, been the complete surrender of China to the Communist armies of that Country. It remains

to be seen, however, whether the new China will, in fact, be such an obedient child of Russia as the Balkan and other States within easier reach of the parental arm. Trade with the Free Nations is essential to China's economy whatever the political complexion of her government. The fact that Britain has recognized the new regime may help to preserve Chinese sovereignty and to thwart, to some extent, Russia's ambitions to wield unlimited power in the Far East.

At first sight, it may seem that the different policy of the United States in refusing to recognize the Communist Government of China indicates a source of weakness in Anglo-American relations. In fact, whether intentional or incidental, it has the makings of a happy co-operation in handling the situation. Strategically, it is essential that the geographical expansion of Communism in the Far East should be checked: 'so far and no further' must be the order of the day. The United States is still in a position to give that order and it has been given: Formosa, the last stronghold of the anti-Communist Chinese, has been taken under the American protective wing. The Island is one of the outposts of the defence of the Pacific and will remain so. It can do no serious harm to American economic interests in China that Britain should have recognized the *de facto* government; it is all in the interests of British as of other Free Nations' concerned with stopping further aggression, that the United States should have constituted themselves the guardians of that particular locality.

Korea

So we come to Korea. The unprovoked attack by the Communist-dominated Northerners on their fellow countrymen South of the 38th Parallel is in a very different category from the civil war in China, because it is a direct challenge to the authority of the United Nations Organization and its Security Council. That challenge, thanks to American initiative, was taken up at once, and the issue is now being fought out with all the violence of modern warfare save the use of the atom bomb. The majority of the Free Nations in a position to do so are joining forces with the United States, one of the first of their representatives to arrive on the scene of action being the British Far East Fleet, with Service contingents from Canada, Australia and New Zealand not far behind. Unlike the futility of the League of Nations in similar circumstances, the United Nations have shown that they mean business.

This must have been something of a shock for the Communist Supreme Command; for Korea has obviously been selected as a site for testing the strength of the Free Nations' union and the preparedness of their fighting Services. The Northern Koreans are being used to make this test at the cost to Russia of a relatively small expenditure in armaments, but at a vast cost in the lives of her dupes.

The course of this war is recorded elsewhere in this JOURNAL, but it would not be surprising if it should be found that Communist generalship has—on the traditional Russian plan—relied on weight of manpower, while MacArthur's strategy has been governed by readiness to give ground until mechanized and air forces have been built up to a strength which will enable a counter offensive to be launched with devastating effect.

SABOTAGE

The recent explosion of ammunition at Portsmouth was but one of several cases of sabotage within our defences—a symptom of Communist Fifth Column warfare in its early stages. It is a warning to look to our Security organization and get it back on a war footing, and to make every possible effort to trace these attacks to their

real source and bring their instigators as well as their perpetrators to condign punishment.

Whatever the immediate outcome of the present trial of strength, we may be sure that the Free Nations, having put their hands to the plough, will not turn back. It remains to be seen whether Russia will accept the " loss of face " of the inevitable failure of her war by proxy and first trial of strength with the Free Nations, or whether the Kremlin caucus will embroil the World in a third, and the greatest of all wars. One thing is certain. Communism will never cease aggression until it is finally checked and exterminated. Faith and loyalty alone can protect the Free Nations against political infiltration, and the sufficiency and readiness of their armed forces against physical violence.

CORRESPONDENCE

(Correspondence is invited on subjects which have been dealt with in the JOURNAL *or which are of general interest to the Services. Correspondents are requested to put their views as concisely as possible, but publication of letters will be dependent on the space available in each number of the* JOURNAL.—EDITOR.)

THE PATTERN OF A FUTURE WAR

To the Editor of the R.U.S.I. JOURNAL.

SIR,—In his article which appears in the JOURNAL of May, 1950, Captain Pelly makes an unanswerable case for priority to be given in our national strategy to the requirements for the protection of the Merchant Navy, to be achieved in the main by the Royal Navy.

But, while such priority is without doubt the basic essential, is it not somewhat unrealistic to assume that such priority should be granted in our peace preparations, or even in the early stages of a war.

It seems more than likely that a war of aggression on the part of our only probable enemy would be initiated by an air attack in the utmost possible force, undertaken with the minimum possible warning, and it is the effect of such an attack that Captain Pelly appears to have underestimated in his argument.

Our enemy would be as conscious as we are ourselves of the British dependence on sea power, and would in all probability direct his air attack primarily to our aerodromes, but secondly to our great naval and commercial ports and harbours, and later to our centres of administration, our inland communications and especially to our oil depots.

Were such an attack to succeed, our ability to strengthen and maintain and later to exercise our sea power, might well be so restricted and so continuously hampered that recovery within a reasonable time would be impracticable, and the Country be reduced to submission. It should never be forgotten that in each of the two Great Wars we were at one time within measurable distance of such a calamity.

To pursue Captain Pelly's analogy, what would be the use to the boxer of his sound heart, if he had permitted his physical powers to go to pieces by default, and been compelled to acknowledge defeat.

The facts are that while the security of sea communications must be the fundamental principle of our national strategy, air control is necessary in order to obtain it. Also, since air operations achieve their results far more rapidly than those of the sea or land, we cannot afford to be overwhelmed in the air while the slower preparations to substantiate our sea control are maturing.

I conclude therefore that the first priority in our preparations for national defence should be given to protection against air attack, to be achieved by a supreme Air Force, together with an Anti-Aircraft defence of the maximum strength and efficiency.

The enemy's submarine attack which could have, at the most, only a gradual effect, would no doubt secure some initial advantage by the proposed allocation of priority, but the attack would certainly be opposed from the beginning, and would be dealt with in ever-increasing measure as soon as the first onset from the air had been mastered.

Once air defence has been secured, sea and air forces should have an equal priority, dependent as they are on each other to achieve their objects, and on their success depends ultimately the provision and maintenance of this Country as the operational base for the land operations by which victory would be achieved.

SYDNEY R. FREMANTLE,
Admiral.

11th July, 1950.

SIR,—The trio of articles on " The Pattern of a Future War " which appeared in the May JOURNAL may give the impression that war can still be viewed from the three aspects —Sea, Land and Air. A more realistic and profitable classification for this Country would surely be the aspects of " The Defensive " and " The Offensive."

For the simple reason that it will never afford the forces to take the offensive on a grand scale at the outbreak of a war, Britain must be thrown on the defensive to begin with. Unless our defence is sure we may never be in a position to take the offensive at all. It is obvious that the major enemy—following the German pattern—will start a war with a simultaneous air and submarine offensive. If we are not prepared to meet both forms of attack immediately we shall be knocked out in a very few weeks. If our air defences are overwhelmed, our centres of government and organization for directing the war, our ports, stores, communications, indeed the very sinews of this Island Base, will be destroyed. If our sea communications are cut by submarines our people and our whole war effort must die of, not slow, but very rapid starvation.

It will be argued that in peace-time we cannot afford the forces needed for this dual defence, to which the reply must be " do we wish to continue to live in a fools' paradise of welfare luxury to-day with humiliating defeat awaiting us tomorrow ? "

In a future war there will be no *time*, as there has been in the past, to make good our deficiencies.

" OBSERVER."

July, 1950.

TRANSJORDAN AND ARAB PALESTINE

SIR,—The note in the International Situation section of the JOURNAL of May, 1950, on " Arab Palestine " might give the impression that King Abdullah's action in bringing about its unification with Transjordan was a smart piece of political manœuvring, and that the people of Arab Palestine were given little choice in the matter. In fact, the details of the unification were worked out in a thoroughly democratic way.

In order to understand how this came about, one must go back to the situation as it was at the time of the end of the British mandate. At that time, the mayors of Arab towns and other local Palestine celebrities, fearing that the Israelis would immediately on departure of the British seek to extend their frontiers beyond those allotted to them by the U.N.O. partition plan, and having no defence forces of their own, implored King Abdullah by letter, telephone and personal calls, to send the Arab Legion into Palestine to protect them.

Following on the occupation of parts of Palestine by the Arab Legion, civil and military governors, nearly all of whom were Palestinians of considerable local prestige, were appointed to districts. After several months of alternate war and peace, during which the Israeli attacks were held by the Arab Legion and a gradual feeling of security had spread among the Arab Palestinians, a real desire throughout all levels of the community for union with Transjordan manifested itself, and King Abdullah was asked if the two Countries could be incorporated. This he agreed to on condition that an overwhelming vote from the people on both banks of the Jordan should prove that such union was in accordance with the general wishes of all concerned.

The Palestinians, meanwhile, were going ahead with the organization of their own constituencies grouped round the major towns, and nominations were invited for candidates who would represent them in the joint Parliament. A number of constituencies, some with two or more seats, were devised to represent the population of Arab Palestine which was approximately equal in numbers to that of Transjordan. Transjordan was also divided into a number of constituencies returning 20 members. Nominations were made —often as many as ten for two seats—and nominees deposited a sum of money (as in England) to cover expenses and as a promise of their *bona fides*. Candidates could be

nominated by anyone ; and anyone, provided he had sufficient local support, could be nominated.

Voting took place, and of the 150,000 Palestinians eligible to vote, over 80 per cent. went to the polls. The lower age limit for the vote was 25 years. Women did not have the vote.

At the meeting of the combined Parliament in April of this year, the vote of the twenty Transjordanian and twenty Palestinian elected representatives was unanimous for unification.

The Arab League was informed of the intention to unify the two Countries. The League was not asked for permission since it had already made plain its opposition to unification.

I hope that this will help to make plain that this was no annexation of power imposed on a weak and helpless Arab Palestine, but was an act of unification as much desired and desirable by the Palestinians as by the Transjordanians and King Abdullah.

R. K. MELVILLE, *Lieut.-Colonel,*

22nd June, 1950. *Staff Liaison Officer, Arab Legion.*

THE ARMAMENT OF MODERN INFANTRY

SIR,—It is a pity that Colonel R. V. Shepherd's interesting thesis on " The Armament of Modern Infantry " (see the JOURNAL of February last) is confused by a rather vague use of technical terms. A revolver and an automatic pistol are two entirely different types of weapons. The machine carbine is not always a particularly light arm, and the so-called automatic rifles used abroad are frequently semi-automatic rifles, with the characteristic that the trigger must be pressed for each discharge.

If we are prepared to accept a lower standard of weapon efficiency, are our enemies ? It is believed that our English archers at Agincourt could do effective work at 220 yards, and they were supposed to be able to keep three arrows in the air. In range and accuracy are we no better now than our predecessors of five centuries ago ? If infantrymen trained and equipped for a maximum range of 300 metres meet troops of the shooting standard of the Boers in the Boer War the result would probably be unfortunate.

A lighter cartridge would be a great boon, but for general infantry use there may be drawbacks. Could Colonel Shepherd's proposed weapon, for example, be used as an automatic arm and yet be an accurate weapon, and could the infantryman carry enough of the proposed light cartridges to use it as an automatic ? The question of efficient cooling would also have to be considered.

Fire power without accuracy is apt to be a delusion. If a trained rifleman can obtain, for example, one casualty for every three rounds of conventional rifle ammunition where the partially trained conscript requires thirty rounds of the proposed cartridges for each casualty then, surely, we ought to urge more target practice.

Is not this the real difficulty ? Trained marksmen are scarce because we do not attach sufficient importance to proper rifle training. We have lost our tradition of accuracy which the English bowmen had. Civilian marksmanship should be used as a foundation for military efficiency. In the British Dominions many lads of 18 are excellent and experienced shots. It should be so here. If the Swiss can foster rifle shooting, as they do, we ought to be able to do the same. The expert marksman with an accurate semi-automatic rifle is superior to the half-trained man with anything else, and it should be cheaper to train marksmen than to lose battles.

E. H. BAXTER.

May, 1950.

SIR,—Recent contributions to the JOURNAL make one suspect that many believe the high velocity small bore rotated bullet to be the only conceivable missile for the infantryman to use against his "opposite numbers." With all diffidence, I suggest that modern gunsmith's art could evolve a 1-pdr. self-loading shoulder-controlled howitzer for the use of the platoon or company.

Such a weapon ought to surpass, in every aspect of its performance, the conventional light machine gun. I envisage an extreme range of 800 yards, or rather more, but with an H.E. shell, this will also be an effective range.

Given a well-designed projectile of good material, the greatest advantage of this equipment will be economy in weight of ammunition. As an example, a full twenty-five round magazine for a light machine gun weighs some ounces over two pounds. The complete round for our proposed 1-pdr. howitzer will weigh only half this because its cartridge should only be of 2 or 3 ounces. Furthermore, its shell should give us quite twenty-five lethal fragments, each propelled at nearly 20,000 f.s., against the 2,000 f.s. odd of the rifle bullet. In a word, we may reasonably expect a burst twice as powerful as that of No. 36 grenade, designed, for ammonal, 35 years ago.

Even so, the safety zone prescribed by regulation for No. 36 is 600 yards across. Divide this by ten, for fair measure, and its "beaten zone" still remains many times larger than the 600-yard triangle of 8 yards base swept by a half-magazine for the L.M.G.

A second major advantage lies in the moral effect of H.E. fire against human targets. Many experienced infantry commanders will agree that a battalion which has lost 25 per cent. from H.E. is as badly knocked about as one which may have sustained 75 per cent. from machine gun bullets.

Yet other points in favour of the howitzer are that it can blow the enemy out of slits and trenches in which he is fully safe from the H.V. bullet; that the effect of fire and its "strike" are immediately visible, and that H.E. can be effective against buildings.

Admittedly, good fire discipline will be essential, because a single-trigger pressure from the howitzer will discharge twice the gross weight of ammunition but, as we have seen, this should be many times as effective.

The mortar, as at present constructed, is not a serious competitor because of its crudity, lacking as it does even a gas-check. All the same, modern mortar experience leads one to hope that our 800-yard 1-pdr. may weigh less than a rifle, and that shoulder control will be practicable, at least at the shorter ranges.

L. V. S. BLACKER,
Colonel.

July, 1950.

TRANSFER OF CAVALRY TO THE R.A.C.

SIR,—It has been brought to my notice that there is a slip in my article on "New Corps, Regiments and Army Services of the 1938–49 Period," in the May number of the JOURNAL. On page 276 I stated that "all regiments of Cavalry of the Line" were grouped together in April, 1939, to form the R.A.C., whereas, in fact, 1st The Royal Dragoons and The Royal Scots Greys (2nd Dragoons) were not transferred to the R.A.C. until 1941—*vide* A.O. 49/1941. Under this A.O. the following five Yeomanry Regiments were also transferred to the R.A.C.:—

The Royal Wiltshire Yeomanry.
The Warwickshire Yeomanry.
The Yorkshire Hussars.
The Nottinghamshire Yeomanry.
The Staffordshire Yeomanry.

These later additions to the R.A.C. do not, however, affect the fact that it became a new Corps in April, 1939, as stated in the article.

T. J. EDWARDS,
Major.

June, 1950.

GENERAL SERVICE NOTES

NORTH ATLANTIC TREATY ORGANIZATION

The North Atlantic Council, consisting of the Foreign Ministers of the twelve member-nations of the North Atlantic Treaty Organization, held its fourth session at Lancaster House, London, from 15th to 18th May.

At the conclusion of the session on 18th May, Mr. Acheson (U.S.A.), who acted as Chairman stated that genuine and substantial progress had been made by taking certain major decisions. These included :—

(*a*) The issuing of directives to the Defence Committee and the Defence Financial and Economic Committee to guide them in their future work.

(*b*) The recognition of the indispensability of self-help and mutual aid among the member Countries whereby each party would make its full contribution to achieve the integrated strength necessary for the North Atlantic area.

(*c*) Recognition that effective military defence of the member-nations must be achieved along the lines of the most economical and effective utilization of the forces and material at the disposal of the North Atlantic Countries.

(*d*) The establishment of a North Atlantic Planning Board for Ocean Shipping.

Subsequently Mr. Bevin and Mr. Acheson reaffirmed the continuing interest of Great Britain and the United States in the security of Greece, Turkey and Persia.

WESTERN UNION

On 20th July, the five Defence Ministers of the Brussels Treaty Powers met at Fontainebleau under the chairmanship of M. René Pleven—the French Prime Minister. Great Britain was represented by Mr. Shinwell—Minister of Defence, accompanied by Air Chief Marshal Sir John Slessor and Air Marshal Sir William Elliot. Field-Marshal Lord Montgomery, chairman of the Commanders-in-Chief Committee of Western Union, and General de Lattre de Tassigny, Air Chief-Marshal Sir James Robb, and Admiral Jaujard also attended the meeting.

The announcement published after the meeting stated :—

"The Ministers considered the international military situation and proposals drawn up by the Commanders-in-Chief. They recognized the necessity of speeding up without delay the production of the war material and of increasing the defensive power of Western Union land, air and sea forces as a guarantee against aggression."

Although the Defence Ministers are not empowered to discuss financial matters affecting the Brussels Treaty Powers, the gist of their decision at Fontainebleau implied a revision of the defence estimates previously agreed upon. This was inevitable in the face of recent developments in Korea and on the increased military effort furnished by the United States. The Defence Ministers will presumably raise this matter with their respective Governments in the near future. The French Government, in any case, has recognized the need to increase its military budget by 90,000 m. francs as a first instalment.

GREAT BRITAIN

THE PRIME MINISTER'S CALL TO THE NATION

In a broadcast to the Nation on 30th July, the Prime Minister—Mr. Attlee, after a survey of the events leading up to the War in Korea, the part Britain is taking on behalf of the United Nations and a warning regarding the possible dangers which might arise therefrom if the necessary efforts were not made to check aggression and to take precautions against it, then turned to the questions of the Services, Civil Defence and the enemy within and said :—

"We need more Regulars. We need skilled men in all three Services. We require more men and women to join the Territorial and other auxiliary services.

I am certain that there is no better way of serving the country in these difficult times than this.

" There is, too, civil defence. We all hope that it will not be required, but it is right to be prepared. Many thousands are needed in the Civil Defence Corps, the Auxiliary Fire Service, the National Hospital Service, and the Special Constabulary. I would ask men and women to volunteer now so that, should an emergency come, they will be fully trained. The experience of former members of these forces will be especially useful in building up efficient organisations.

" Thirdly, I would ask you all to be on your guard against the enemy within. There are those who would stop at nothing to injure our economy and our defence. The price of liberty is still eternal vigilance . . . there have been recent cases of sabotage, such as the outrage at Portsmouth. I do not yet know who was responsible, but clearly they were prepared to murder many innocent people to gain their ends. . . ."

EXERCISES AND DEMONSTRATION

STAFF COLLEGE CAMBERLEY.—Field-Marshal Sir William Slim, Chief of the Imperial General Staff, has held the fifth of the post-war annual conferences and tactical exercises for the Army at the Staff College, Camberley. The exercise, named " Horatius " was for the study of defence in warfare and lasted from 23rd to 26th May.

General officers of the Army from both home and oversea commands attended, together with officers from the Royal Navy and Royal Air Force. Military representatives were present from the Commonwealth Countries, the United States, the Western Union Countries, and the Western Europe Commanders-in-Chief organization.

COMBINED ASSAULT DEMONSTRATION.—To acquaint students of the Army Staff College, Camberley, with modern assault landing methods and equipment, a demonstration was held in the Portsmouth and Isle of Wight areas on 4th and 5th July. It took the form of a combined exercise known as " Run Aground " in which the Royal Navy, Royal Marines, detachments of many arms of the Army, including the Royal Armoured Corps, Royal Artillery, Royal Engineers, Royal Signals, Royal Army Service Corps, and infantry of the Northumberland Fusiliers co-operated.

The students witnessed assault landing and cliff scaling by Royal Marine Commandos at Culver Cliff, Isle of Wight, and were shown various methods employed to get heavy equipment and weapons up the cliff from the beach.

Later at Eastney beach there was a demonstration of assault landing on a defended beach with tanks and vehicles. Landing ships and craft were also used, and the students were shown some modern specialist armour and landing equipment.

CIVIL DEFENCE EXERCISE " JOLLY JACK "—A Civil Defence Exercise known as " Jolly Jack " took place in the Canteen Theatre, Royal Naval Barracks, Chatham, on Wednesday, 19th July, 1950.

The Commander-in-Chief, The Nore—Admiral Sir Henry Moore, the Director General of Training (Civil Defence), Home Office—Sir John Hodsoll and a representative of the G.O.C., Home Counties District—Brigadier D. W. Bannister, were among those taking part in the discussions.

Problems of mutual interest to the fighting Services and civil defence authorities were discussed but there was no operational exercise.

COMMONWEALTH ADVISORY COMMITTEE ON DEFENCE SCIENCE

A meeting of the Commonwealth Advisory Committee on Defence Science was held in this Country from 3rd to 20th July. It was attended by senior defence scientists of the Commonwealth Countries and by senior serving officers concerned with the scientific aspects of war.

The object of the Committee is to promote scientific research relating to defence in all fields by closer collaboration within the Commonwealth. There have been previous meetings of defence scientists from the Commonwealth Countries, but this was the first to take place under the constitution of the new Committee and to be attended by representatives of the United Kingdom, Canada, Australia, New Zealand, South Africa, India and Pakistan.

For the first week from 3rd to 8th July, the Committee held meetings in Cambridge and the delegates were accommodated in one of the colleges. During the remainder of the time opportunity was given to the delegates to visit research establishments in various parts of the Country.

One of the main aims of the conference was to give defence scientists of the Commonwealth an opportunity to meet and exchange views on matters of current importance. In addition to the delegates, a number of distinguished scientists in this Country were invited to attend parts of the conference which interest them, so that they could lend their knowledge and experience to the discussions. The Chairman of the conference was Sir Henry Tizard, Chairman of the U.K. Defence Research Policy Committee.

SCIENTIFIC ADVISERS TO THE MINISTER OF DEFENCE

The Ministry of Defence has announced that Sir Henry Tizard, who has been Scientific Adviser to the Minister of Defence since 1947, will carry out this responsibility on a part-time basis only. Sir Frederick Brundrett, previously chief of the Royal Naval Scientific Service, took up an appointment in the Ministry of Defence as his deputy, with effect from 1st July. Sir Henry Tizard will continue as chairman of the Defence Research Policy Committee.

CHIEF OF COMBINED OPERATIONS

The Ministry of Defence has announced that Major-General C. E. Wildman-Lushington, Royal Marines, who retired from his appointment as Chief of Combined Operations Staff in July, has been succeeded by Major-General V. D. Thomas. Major-General Thomas was previously Chief of Staff to the Commandant-General, Royal Marines.

RECRUITING

Figures for recruitment to the Armed Forces, issued on 23rd May by the Ministry of Defence, show that the total number of other ranks—men and women, in all Services. was 13,560 for the first quarter of the year. This total was made up as follows: R.N., R.M. and W.R.N.S., 3,047; Army and W.R.A.C., 6,366; and R.A.F. and W.R.A.F., 4,147. The figure for the whole of 1949 was 58,706 (52,201 men).

STRENGTH OF THE AUXILIARY AND TERRITORIAL FORCES

The strength of the Auxiliary and Territorial Forces on 31st March, 1950, was 106,975, made up as follows:—

R.N.V.R.	5,466
R.M.F.V.R.	531
Territorial Army and W.R.A.C.(T.A.)	85,940
R.A.F.V.R.	8,609
R.Aux.A.F.	6,429

The Royal Observer Corps numbered 14,429.

CIVIL DEFENCE RECRUITMENT

The Home Office has announced that the membership of the Civil Defence Corps in England and Wales on 31st March totalled 24,649 (17,908 men and 6,741 women). New recruits since the end of January totalled 3,264 (2,183 men and 1,081 women).

TENTH ANNIVERSARY OF DUNKIRK

Ceremonies were held at Dunkirk on 4th June to celebrate the anniversary of the fighting in June, 1940. French, British, and Belgian ex-Service men paraded in front of the station with French and British sailors, and a detachment of French infantry from Constance. About fifty of the " little ships " which took part in the evacuation of allied troops came from England, together with the destroyer " Bleasdale." The French Navy sent the cruiser " Georges Leygues."

The main ceremony was on the beaches of Malo-les-Bains, in the presence of Vice-Admiral Nomy, representing the Minister of National Defence.

BURMA WAR MEMORIAL

Relatives and friends of those who gave their lives in the Burma campaign attended a service of thanksgiving and remembrance in Westminster Abbey on 11th May.

During the service Vice-Admiral the Earl Mountbatten of Burma handed over to the Dean of Westminster a Memorial Book containing the names of 10,693 British men and women who perished in the defence and liberation of Burma. The Book will be kept within the precincts of Westminster Abbey until a War Memorial Chapel in Rangoon Cathedral is ready for its reception.

DESPATCHES

A Despatch submitted to the Supreme Commander, Allied Expeditionary Force, on 1st January, 1944, by Admiral of the Fleet Sir Andrew B. Cunningham, G.C.B., D.S.O., C.-in-C. Mediterranean, in connection with the Invasion of Sicily, was published on 28th April as a Supplement to the *London Gazette* of 25th April, 1950.

A Despatch submitted to the Lords Commissioners of the Admiralty on 8th March, 1945, by Admiral of the Fleet Sir Andrew B. Cunningham, G.C.B., D.S.O., C.-in-C. Mediterranean, in connection with the landings in the Gulf of Salerno on 9th September, 1943, was published on 2nd May as a Supplement to the *London Gazette* of 28th April, 1950.

A Despatch submitted to the Secretary of State for War on 19th April, 1947, by His Excellency Field-Marshal The Viscount Alexander of Tunis, K.G., G.C.B., G.C.M.G., C.S.I., D.S.O., M.C., former G.O.C.-in-C., Fifteenth Army Group, in connection with the Allied Armies in Italy from 3rd September, 1943, to 12th December, 1944, was published on 12th June as a Supplement to the *London Gazette* of 6th June, 1950.

DOMINIONS AND COLONIES

CANADA

COMMISSIONS FOR UNDERGRADUATES WITH WAR SERVICE.—Commissions in the Active List of the Navy, Army and Air Force are again being offered this year to selected students who served in the recent War and who will be entering their final university year in September. There will be 90 vacancies: 20 in the Navy, 50 in the Army and 20 in the Air Force. The plan was introduced in 1948, and in the first year 15 were accepted by the Navy, 119 by the Army and 72 by the Air Force.

Students selected, and who are due to graduate in the Spring of 1951, will receive Commissions at the start of their final university year; the Department of National Defence will pay their tuition fees, provide funds for books and equipment and will also pay them full pay and allowances of a Sub-Lieutenant, 2nd Lieutenant, or Pilot Officer.

RED RIVER EMERGENCY.—Emergency relief was provided by the combined efforts of Canadian Servicemen during the emergency caused by the Red River floods in May.

AUSTRALIA

NATIONAL MILITARY TRAINING.—The acting Prime Minister—Mr. Fadden, announced on 13th July that the Cabinet had decided to introduce national military training as soon as possible.

FORCES FOR KOREA.—On 2nd August, Mr Fadden—Acting Prime Minister, announced that as an immediate contribution to the United Nations Forces in Korea, the Australian Infantry Force serving in Japan would be built up to its full war establishment and men volunteering from it would serve in Korea. Volunteers from the Regular Army in Australia will be flown to Japan to make up the required numbers. At the end of May the Australian Forces in Japan totalled 2,374 men.

SUPPLY PLANNING BRANCH FOR DEFENCE.—On 11th May the Minister for Supply announced the formation of a Defence Supply Planning Branch within the Federal Department of Supply.

The Minister said that while the Australian Government had high hopes that World peace would be maintained, it was taking precautions in the light of Australia's relative isolation in the South-West Pacific. Broadly speaking, the Defence Supply Planning Branch would plan to meet the Supply requirements of the Services in emergency, would survey war potential capacity, and would devise means for meeting any deficiencies in that capacity. It would co-operate with industry on plant preparedness for emergency, and in due course would initiate surveys of industrial facilities to meet defence needs and essential Civil requirements; it would also work closely with the Services and other government departments.

MEMORIAL TO UNITED STATES FORCES.—Mr. Menzies, the Prime Minister, in a national broadcast on 1st May, launched an appeal of the American Australian Association, of which Mr. R. G. Casey, the Minister for National Development, is president, for £A50,000 for the erection at Canberra of a national Memorial to the contribution of the United States forces to the defence of Australia during the second World War.

The Memorial will be an octagonal aluminium shaft, 200 ft. high, surmounted by the American eagle on a sphere, flanked by pylons carrying the arms of the United States and Australia.

PAKISTAN

VISIT OF H.I.M. THE SHAHINSHAH OF PERSIA.—H.I.M. The Shahinshah of Persia visited Pakistan during March as the guest of the nation. He arrived in Karachi on 1st March and, after visiting as many places as possible during his stay, he departed by air on 16th March, escorted by a squadron of the Royal Pakistan Air Force. While visiting the Frontier Province he watched an " attack " staged by the 3rd Armoured Brigade and, on the following day, witnessed an impressive Air Display given by the Royal Pakistan Air Force at Risalpur.

TERRITORIAL FORCE.—Mr. Liaquat Ali Khau—the Pakistan Premier and Minister of Defence, has announced that the Government had decided to raise Territorial Forces in Pakistan, especially in East Pakistan, and to introduce the necessary legislation. He added that the question of forming a National Cadet Corps was under consideration.

KASHMIR

The United Nations Secretary-General announced on 12th June that General Courtney H. Hodges had been appointed Military Adviser to Sir Owen Dixon, the United Nations mediator in Kashmir. General Hodges commanded the United States First Army during the 1939–45 War, and took a prominent part in the Normandy landings, the liberation of Paris, and the invasion of Germany.

MALAYA

Official statistics issued in Kuala Lumpur on 6th July show that bandit incidents in May at 509 were the highest in any one month since the emergency began. From the beginning of the year until May the number had grown progressively higher: January, 145; February, 225; March, 290; and April, 380. Terrorists killed in May were 55, bringing the total this year to 250. Ten terrorists were captured in May. Surrenders up to 23rd June were 403.

INDIA

DEFENCE SERVICES' STAFF COLLEGE.—On 23rd May, 1948, an Air Wing was added to the Staff College at Wellington, and the College was re-named the Inter-Service Staff College. The title was again changed to the Defence Services' Staff College when a Naval Wing was added on 6th May, 1950. The course which commenced on 1st August includes students from the United Kingdom, Canada, Australia, the United States of America and Burma.

NATIONAL DEFENCE ACADEMY.—The Armed Forces' Academy at Dehra Dun has been renamed the National Defence Academy. The Academy is divided into two Wings, the Joint Services' Wing which runs a two-year course for cadets of all three Services, and the Military Wing which runs a further two-year course for cadets selected for the Army after they complete the course in the Joint Services' Wing. Cadets for the Navy and the Air Force, after completing the course in the Joint Services' Wing, proceed to Naval and Air Force training establishments prior to being commissioned.

Meanwhile work on the new National Defence Academy at Kharakvasla (near Poona) is proceeding. Here the period of training for cadets of all three Services will be for three years, and they will be commissioned on completion of the course. The age for admission will be between 15 and 17 years, and the annual intake will be 500 Cadets.

NATIONAL CADET CORPS.—In order to develop character and leadership in youth, to stimulate an interest in the defence of the Country and to build up a reserve of potential leaders in case of emergency, it was decided in July, 1948, to form a National Cadet Corps. This Corps, which was constituted by Act of Parliament, consists of three Divisions—a Senior Division, a Junior Division and a Girls' Division, and the scheme is operating in all States. Large numbers of college and school staffs and students have joined. Trainees do four parade hours a week. The Senior Division has an annual camp of 15 days, and the Junior Division has one of 14 days. Two Air Wing Units have been raised, and there are three Girls' Units.

FOREIGN

DENMARK

SINGLE MINISTRY FOR DEFENCE.—Hr. Hansen, the Defence Minister, introduced a Defence Bill into the Folketing on 26th April, as agreed in the defence committee by the Social Democrats, the Peasant Party, the Conservatives, and the Radical Left, the last with minor reservations.

The main points are that the Service Departments are merged into a single Ministry and that for the first time in Denmark's modern history unity of command is established for all three Services. There will be one Commander-in-Chief, with a defence staff and a defence board under him. A special scientific research board is also established. The Navy and Air Force will each have its own commander. The Army, however, will have two—one for the forces East and the other for those West of the Great Belt.

NORTHERN EUROPEAN GROUP DEFENCE MEETING.—Mr. Shinwell, the British Minister of Defence, while in Copenhagen at the end of June for an ordinary meeting of the northern European group of the Atlantic Treaty Powers, told a Press conference that the Baltic Sea would be one of the important topics at the conference. Of the recent Soviet suggestion that the Baltic should be closed to foreign warships, Mr. Shinwell said :—

> " Provision was made in the North Atlantic Pact for a naval contribution in the event of aggression in any quarter. Both Denmark and Norway can rest assured that we fully appreciate their position, and every effort will be made by the United Kingdom and other Atlantic Pact signatories to render assistance if and when such assistance should become necessary. We hope it will never be necessary."

FRANCE

An important reorganization of the French High Command was announced in a decree issued in April, which laid down that the supreme direction of national defence

would henceforth consist of (1) a Permanent General Secretariat of National Defence; (2) a Chiefs of Staff Committee, and (3) a Combined General Staff of the Armed Forces.

The Permanent General Secretariat of National Defence will co-ordinate all activities relating to national defence, and will at inter-Ministerial level be responsible *inter alia* for national mobilization, national protection measures, economic and financial problems arising from war conditions, psychological action, scientific research, and instruction given in the *Institut des Hautes Etudes de la Defense Nationale*.

The Chiefs of Staffs Committee will function as the Military Council of the Government and as the supreme military authority over the armed forces.

The Combined General Staff of the Armed Forces, operating side by side with the Chiefs of Staff Committee, will have responsibility for the planning of inter-service collaboration and co-ordination, mobilization problems, military training, and transport, and will supply the Secretariat for the Chiefs of Staff Committee.

INDO-CHINA

In a statement to the *Agence France Presse* on 9th April, M. Letourneau—the French Minister for Overseas France, declared that if the French Expeditionary Forces were withdrawn from Indo-China, Vietnam, Cambodia, and Laos would collapse as the result of civil war or occupation by "other forces," which had given examples elsewhere of their attitudes towards the independence of States drawn into their orbit The French administration in Indo-China, he added, had already relinquished control of the internal machinery of those States, and the next step was to ensure that they should have effective armies of their own for the protection of their sovereignty and the maintenance of order. The French Government would provide skilled leadership for these armies and was negotiating with the United States for the supply of arms and equipment; to be effective, however, all foreign aid, whether military or economic, would have to be co-ordinated and distributed jointly by a quadripartite organization similar to the O.E.E.C., consisting of the three Indo-China States and France.

Subsequently, Mr. Robert Blum—head of the United States Mission to Indo-China, who was received on 30th May by Tran Van Huu, Premier of Vietnam, reported that the first instalment of United States economic aid would amount to 23,500,000 dollars, which would be divided between Vietnam, Cambodia and Laos.

ITALY

On 21st July the Council of Ministers discussed defence questions which have come to the forefront of affairs since the Korean war began.

Italy is limited, by the peace treaty, in the men and armaments she may possess, but hitherto not even those limits have been reached. After the meeting Signor Pacciardi —the Minister for Defence, said that the present strength of 175,000 men (army and carabinieri) will be raised to the 250,000 foreseen by the peace treaty.

Although this is an obvious and easy step to take, the real need for Italian defence is that the forces should be adequately equipped with modern weapons, which is not the case at the moment. Within the framework of the North Atlantic Treaty Italy has no need for a large army, but she does require a small, mobile and highly mechanized force.

The cost of building up the armed forces could not fall far short of 100,000m. lire. Where this is going to come from, given the programme of investment for social and economic progress, is not clear.

KOREA

For a summary of recent events in Korea, see page 486.

PERSIA

An agreement was signed in Washington on 23rd May providing for American military assistance to Persia under provisions of the Mutual Defence Assistance Programme of 1949, its terms being similar to those of the bilateral agreements between the United States and the Countries of the North Atlantic Treaty Organization. The agreement stipulated *inter alia* that the Persian Government would not transfer any of the equipment received under the programme to any third Government without specific United States' sanction, that it would take steps to guard against the disclosure or compromise of materials, services, or information, and that it recognized that economic recovery is essential to international peace and security and must be given clear priority. The Mutual Defence Assistance Act of 1949, appropriated the sum of 27,640,000 dollars for Persia, Korea and the Philippines.

RUSSIA

On 17th June, the Union Council of the Supreme Soviet adopted the 1950 State Budget providing 79,400 m. roubles (£7,089,285,700) for defence. Of this figure, representing 18.5 per cent. of the whole budget expenditures, 64,000 m. roubles were allotted to the Army and 15,000 m. to the Navy.

Total income estimated in the Budget was 433,000 m. roubles, with expenditure 427,000 m. The balance of 6,000 m. roubles compares with a surplus of 24,700 m. last year.

SIAM

The Siamese Prime Minister—Marshal Luang Pibul Songgram, announced in April that the United States had made available to Siam $10,000,000 worth of arms and other military aid, adding that this assistance had been given to enable Siam to resist Communist infiltration from adjacent Countries of South-East Asia.

TURKEY

It was reported from Ankara on 8th June that the Turkish Government has appointed General Noyan as Commander-in-Chief of the Army. He succeeds General Nuri Yamut, who has been appointed Chief of the General Staff. General Noyan is succeeded as secretary of the Supreme Defence Council by General Mahmut Berkoz, Third Army Commander.

Admiral Mehmet Ali Ulgen, Commander-in-Chief of the Navy, General Zeki Dogan, Commander-in-Chief of the Air Force, General Izzet Aksalsur, Vice-Chief of the General Staff, and General Muzaffer Tugsavul, Commander of the Second Army (Dardanelles), have been relieved of their posts. The former Chief of the General Staff, Abdurrahman Nafiz Guran, and General Asim Tinaztepe, Commander of the First Army (Straits and Istanbul), have been appointed to the Army Council.

UNITED STATES

CONSCRIPTION.—On 7th July conscription was ordered in the United States to meet any possible requirements of the war in Korea.

STRENGTH OF THE ARMED FORCES.—A report from Washington dated 7th July stated that the latest figure for the strength of the United States Armed Forces was about 1,370,000, made up as follows: Navy and Marines, 427,000; Army, 593,000; Air Force, 350,000.

FORCES OVERSEAS.—On 30th April, the Department of Defence published figures, hitherto kept secret, of American forces oversea. There were at that date 146,500 troops in Germany. In the Far East there were 123,500, most of them in Japan. In addition to these troops engaged in occupational duties there were 300,000 more stationed outside the United States.

COMPLETION OF POWERFUL ATOM BREAKER.—The most powerful atom-smasher in the World, Columbia University's synchro-cyclotron, built with the co-operation of the

Office of Naval Research, was formally dedicated on 3rd May by General Eisenhower, president of the University, at Irvington, New York.

General Eisenhower called the completion of the machine a " great accomplishment of a free people " working in conjunction with their Government. Observing that dictatorial Governments could also produce such instruments, he declared that " that kind of Government, that kind of control, cannot produce the brains to advance scientifically by the year 2000 or 2050 the distance this Country has to-day."

Dr. John R. Dunning, professor of physics at Columbia, said that the cyclotron had already created mesons—those particles that seem to hold the nuclei of atoms together—and had accelerated hydrogen cores to energies of 385 m. electron volts.

DEVELOPMENT OF NERVE GASES.—An indication that the United States had developed nerve gases that could, without bloodshed or destruction, dissipate the will of an enemy to resist in time of war, was given by Major-General A. C. McAuliffe—Chief of the Army Chemical Corps, in an address to the American Chemical Society in Detroit on 17th April. He said that the Chemical Corps believed that the weapons developed, or now being developed, by the United States provided an opportunity, at the smallest logistical cost, to reduce an enemy's will to resist and thereby obtain victory without enormous destruction of its economy. He added, however, that many German scientific experts on toxic chemical warfare were being exploited by Soviet Russia, and that, in consequence, it must be assumed that we are not the sole possessors of the offensive and defensive secrets of the new nerve gases. He expressed his conviction that the United States would never take a lead in using such weapons, but would employ them only for purposes of retaliation if attacked.

NAVY NOTES

GREAT BRITAIN

H.M. The King

Captain A. I. Robertson, R.N.R., has been appointed a Royal Naval Reserve Aide-de-Camp to the King from 14th June, 1950, in succession to Captain (War Service Rank Commodore 2nd Class) W. L. P. Cox, R.N.R. (Retired).

Surgeon Captain (D) F. R. P. Williams, O.B.E., has been appointed an Honorary Dental Surgeon to the King from 26th February, 1950, in place of Surgeon Captain (D) J. T. Wood, C.B.E., placed on the Retired List.

H.R.H. The Duke of Edinburgh

It was announced on 20th May, that the King has approved the appointment of Lieutenant H.R.H. the Duke of Edinburgh, K.G., R.N., to H.M.S. " Magpie," in command, to date August, 1950. The " Magpie " forms part of the Second Frigate Flotilla, serving in the Mediterranean.

EMERGENCY MEASURES

To meet the requirements of the United Nations Organization in connection with the invasion of South Korea, certain measures have been taken to increase the manpower of the Navy and to speed up new construction.

Increased Manpower

The steps to increase the crews of the Far Eastern Fleet from peace-time strength to that required by continual readiness for action and for other commitments during the present emergency, were stated in a message to the Fleet from Admiral of the Fleet Lord Fraser of North Cape—First Sea Lord.

He said that Their Lordships had found it necessary to seek authority to retain in service officers and regular ratings and other ranks due for release at the termination of their normal period of engagement, and to recall a limited number of officers on the Emergency List, a limited number of ratings and Royal Marine other ranks of the Royal Fleet Reserve and Pensioners. These steps also involve the retention on foreign stations of some officers and men due to return home.

He said that it must be borne in mind that the requirements of the present emergency do not diminish the normal peace-time tasks of the Navy on other stations, or permit any substantial interference with training required to produce the higher and technical ratings of the future.

Their Lordships confidently expect that officers and men who have looked forward with eagerness to an early return home will accept this deferment with fortitude and patience, in the knowledge that the step has only been taken after very full consideration of the vital need for experienced officers and men to be available in sufficient numbers to ensure that the Fleet is at full fighting efficiency. They similarly rely on officers and men recalled from civil life accepting the consequent disorganization of domestic life and civil employment thus unfortunately necessitated, in the realization that these steps are now unavoidable.

Initially these steps will result in an immediate addition of about 1,000 men and between 50 and 100 officers—mostly naval aviation pilots.

The First Sea Lord also said that the Navy is always called upon to act immediately in an emergency, and is always the first to call up reserves. He emphasized that the Admiralty would give sympathetic consideration to compassionate cases affected by recall, and, after referring to the domestic upsets which this action would cause, added : " There is no way out of it ; we must see this thing through."

Expedition of New Construction

In outlining the Government's defence plan, which will involve an additional expenditure of £100 million, the Minister of Defence said that the Navy would speed up the modernization of ships, particularly anti-submarine forces, and their planned programme of new construction.

Ships now under construction include :—

2 Fleet aircraft carriers—the " Eagle " and " Ark Royal " ; both afloat.

4 Intermediate carriers—the " Albion," " Bulwark " and " Centaur," afloat ; the " Hermes," not yet launched.

3 Light Fleet carriers—the " Hercules," " Leviathan " and " Powerful," afloat but completion suspended.

3 Cruisers—" Blake," " Defence " and " Tiger," afloat but completion suspended.

8 " Daring " Class destroyers ; four launched and completing.

2 " Rotherham " Class destroyers, being converted to prototype fast frigates.

Far Eastern Fleet

The strength of the Far Eastern Fleet at present is one light fleet carrier, three cruisers, 16 destroyers and frigates ; also seven Commonwealth destroyers and frigates, and a hospital ship.

Board of Admiralty

The First Lord—Viscount Hall, flew from Northolt to Ballykelly, Co. Derry, early in June for a three-day visit to naval establishments in Northern Ireland. He was accompanied by the Assistant Chief of Naval Staff—Rear-Admiral R. A. B. Edwards, C.B.E., and the Naval Secretary—Rear-Admiral W. W. Davis, D.S.O.

The First Sea Lord—Admiral of the Fleet Lord Fraser, G.C.B., K.B.E., in May visited Scandinavian and Continental ports in the destroyer " Nepal." During his tour he was received by King Haakon of Norway and Queen Juliana of the Netherlands.

Flag Appointments

Portsmouth.—The King has approved the appointment of Admiral Sir Arthur J. Power, G.C.B., G.B.E., C.V.O., to be Commander-in-Chief, Portsmouth Command, in succession to Admiral of the Fleet Sir Algernon U. Willis, G.C.B., K.B.E., D.S.O., the appointment to take effect in early September, 1950.

The Nore.—The King has approved the appointment of Admiral Sir Cecil H. J. Harcourt, K.C.B., C.B.E., to be Commander-in-Chief, The Nore, in succession to Admiral Sir Henry R. Moore, G.C.B., C.V.O., D.S.O., A.D.C., the appointment to take effect on 23rd November, 1950.

Second Sea Lord.—Vice-Admiral A. C. G. Madden, C.B., C.B.E., has been appointed a Lord Commissioner of the Admiralty, Second Sea Lord and Chief of Naval Personnel, in succession to Admiral Sir Cecil H. J. Harcourt, K.C.B., C.B.E., the appointment to take effect in September, 1950.

Assistant Chief of the Naval Staff.—Rear-Admiral E. M. Evans-Lombe, C.B., has been appointed a Lord Commissioner of the Admiralty and Assistant Chief of the Naval Staff, in succession to Rear-Admiral R. A. B. Edwards, C.B.E., the appointment to take effect in November, 1950.

Reserve Fleet.—Vice-Admiral H. W. U. McCall, C.B., D.S.O., has been appointed Flag Officer Commanding Reserve Fleet, in succession to Vice-Admiral A. R. M. Bridge, C.B., C.B.E., the appointment to take effect in November, 1950.

ADMIRAL COMMANDING RESERVES.—Rear-Admiral W. R. Slayter, C.B., D.S.O., D.S.C., has been appointed Admiral Commanding Reserves in succession to Vice-Admiral the Hon. G. H. E. Russell, C.B., C.B.E., D.S.O., the appointment to take effect in October, 1950.

WASHINGTON.—Rear-Admiral J. F. Stevens, C.B.E., has been appointed Chief of Staff to the Head of the British Joint Services Mission, Washington, in succession to Rear-Admiral B. B. Schofield, C.B., C.B.E., the appointment to take effect in November, 1950.

CHATHAM DOCKYARD.—Rear-Admiral A. L. Poland, C.B., D.S.O., D.S.C., has been appointed Admiral Superintendent of H.M. Dockyard, Chatham, in succession to Vice-Admiral G. B. Middleton, C.B., C.B.E., the appointment to take effect on 5th September, 1950.

SCOTLAND.—Vice-Admiral A. E. M. B. Cunninghame-Graham, C.B., C.B.E., has been appointed Flag Officer, Scotland, and Admiral Superintendent, Rosyth, in continuation, the appointment to take effect on 31st July. (Vice-Admiral Cunninghame-Graham was appointed Admiral Superintendent, Rosyth, in February, 1947. The decision to abolish H.M.S. " Cochrane," ship of the Flag Officer Commanding Scotland and Northern Ireland, was announced in the House of Commons on 22nd March, 1950.)

ADMIRALTY DUTY.—Rear-Admiral H. G. Norman, C.B., C.B.E., has been appointed for duty temporarily inside the Admiralty with the Second Sea Lord, to take effect in July.

SECOND CRUISER SQUADRON.—Rear-Admiral C. A. L. Mansergh, C.B., D.S.C., has been appointed Flag Officer, Second Cruiser Squadron, in succession to Rear-Admiral W. R. Slayter, C.B., D.S.O., D.S.C., the appointment to take effect in August.

TRAINING SQUADRON.—Rear-Admiral St. J. A. Micklethwait, D.S.O., has been appointed Flag Officer, Training Squadron, in succession to Rear-Admiral E. M. Evans-Lombe, C.B., the appointment to take effect in September, 1950.

WESTERN EUROPE.—Rear-Admiral P. G. L. Cazalet, D.S.O., D.S.C., has been appointed Chief of Staff to the Flag Officer, Western Europe, in succession to Rear-Admiral R. M. Dick, C.B.E., D.S.C., the appointment to take effect in November, 1950.

NAVAL TRAINING.—Rear-Admiral C. F. W. Norris, D.S.O., has been appointed Director of Naval Training in succession to Rear-Admiral J. F. Stevens, C.B.E., the appointment to take effect in August, 1950.

R.N. SCIENTIFIC SERVICE.—Mr. W. R. Cook, M.Sc., formerly Director of Physical Research at the Admiralty, has been appointed Chief of the Royal Naval Scientific Service, in succession to Sir Frederick Brundrett, with effect from 1st July, 1950. (See also General Service Notes.)

HONOURS AND AWARDS

BIRTHDAY HONOURS

The following were among the honours conferred on the occasion of the official celebration of the King's Birthday on 8th June :—

K.C.B. (*Military*).—Vice-Admiral Michael M. Denny, C.B., C.B.E., D.S.O., and Vice-Admiral Herbert A. Packer, C.B., C.B.E.

C.B. (*Military*).—Rear-Admiral Edward Russell, Baron Ashbourne, D.S.O., Surgeon Rear-Admiral W. J. Colborne, K.H.S., Rear-Admiral R. K. Dickson, D.S.O., Rear-Admiral E. A. B. Edwards, C.B.E., Rear-Admiral D. H. Everett, C.B.E., D.S.O., Rear-Admiral C. C. Hughes-Hallett, C.B.E., Major-General J. E. Leech-Porter, C.B.E., and Rear-Admiral (E) R. G. Murray, C.B.E.

K.B.E. (*Military*).—Vice-Admiral Arthur R. M. Bridge, C.B., C.B.E., and Surgeon Vice-Admiral Clarence E. Greeson, C.B., K.H.P.

C.B.E. (*Military*).—Rear-Admiral (E) J. Breaks, Miss Olga H. Franklin, M.B.E., R.R.C., Matron-in-Chief, Queen Alexandra's Royal Naval Nursing Service, Captain R. Gotto, D.S.O., R.N., Captain (S) R. H. Johnson, O.B.E., A.D.C., R.N., Commander (Acting Captain) S. A. Pears, R.N. (Retired) and Colonel J. H. G. Wills, O.B.E., A.D.C., R.M.

C.M.G.—Commander Clive Loehnis, R.N. (Retired), employed in a Department of the Foreign Office.

H.M.S. "Truculent"

The *London Gazette* announced on 21st April that the King had approved two further awards for outstanding devotion to duty when H.M. Submarine "Truculent" was lost in a collision in the Thames Estuary on 12th January. The awards were:—

Bar to the British Empire Medal (*Military Division*).—Petty Officer Cook (S) Raymond Charles Fry, D.S.M., B.E.M.

British Empire Medal (*Military Division*).—Engine Room Artificer Second Class Leslie Francis Stickland.

Petty Officer Fry was a member of the party which collected in the engine room immediately after the collision. When the engine room was flooded preparatory to the escape from the compartment he went up and vented the trunk. Then he returned into the compartment and gave instructions to junior ratings on the use of their escape sets. He was then sent to open the escape hatch and was to return to report that all was clear. When, however, he unclipped the hatch it flew open and he was dragged out by an air bubble. "Petty Officer Fry's conduct in exceptionally trying circumstances was most praiseworthy and his fine example and calm demeanour throughout had a steadying effect on the others present in the engine room."

Engine Room Artificer Stickland, at the moment of the collision, went immediately to the blowing panel and on his own initiative blew No. 4 port tank to get the submarine upright and later No. 1 port tank to attempt to restore trim. Subsequently, under the First Lieutenant's orders he continued blowing tanks, appreciating, although he could not see his gauges, that additional groups of high pressure air would be required, and for which he gave the appropriate orders. He only finally abandoned his post on the direct orders of the First Lieutenant. "In all his actions E.R.A. Stickland displayed cool and reasoned appreciation of the technical situation."

Royal Humane Society

The Royal Humane Society has awarded the Stanhope Gold Medal to Lieutenant-Commander Robert Pearson, R.N., for the most meritorious rescue attempt reported to the Society during the year. He dived into shark-infested waters off Sierra Leone in an attempt to rescue a man overboard.

Admirals of the Fleet

Promotion to Admiral of the Fleet.—New rules for promotion to the rank of Admiral of the Fleet were announced on 6th May. The existing rules, governed by an Order in Council dated 6th February, 1940, providing that three, and not more than three, of the holders of this rank shall be of less than five years seniority in the rank, have proved unsatisfactory in that they do not provide for an even flow of promotions. The King has therefore approved a revision of the rules to provide that one promotion shall normally be made at regular intervals of 18 months and that vacancies arising from death will not be filled. The first promotion under the revised rules will be made on 22nd April, 1952, and any vacancy occurring due to the death of an Admiral of the Fleet of under five years seniority before that date will not be filled, the list remaining underborne until the next fixed date for promotion becomes due. The date of promotion may be varied as special circumstances require, provided that the interval since the last promotion is not less than 18 months.

Promotion and Retirement

The following was announced in the *London Gazette* on 21st April :—

Vice-Admiral Sir R. S. Gresham Nicholson, K.B.E., C.B., D.S.O., D.S.C., is placed on the Retired List (15th March, 1950).

The following, all to date 1st May, 1950, were announced in the *London Gazette* on 16th May :—

Admiral Sir Robert L. Burnett, G.B.E., K.C.B., D.S.O., LL.D., retires at his own request to facilitate the promotion of junior officers.

Vice-Admiral Sir Claud B. Barry, K.B.E., C.B., D.S.O., retires at his own request to facilitate the promotion of junior officers, and is promoted to Admiral on the Retired List, and reappointed (to serve in the rank of Vice-Admiral).

Vice-Admiral Sir Charles S. Daniel, K.C.B., C.B.E., D.S.O., is promoted to Admiral, and reappointed.

Vice-Admiral (Retired) Sir Vaughan Morgan, K.B.E., C.B., M.V.O., D.S.C., is promoted to Admiral (Retired).

Rear-Admiral H. W. U. McCall, C.B., D.S.O., is promoted to Vice-Admiral, and reappointed.

Rear-Admiral P. K. Enright, C.B., C.B.E., is promoted to Vice-Admiral, and reappointed.

Rear-Admiral (Retired) S. H. T. Arliss, C.B., D.S.O., is promoted to Vice-Admiral (Retired).

Half-Yearly Lists

The following promotions and retirements were approved, to date 7th July, 1950 :—

To be promoted to Rear-Admiral in H.M. Fleet :—

Captain St. J. A. Micklethwait, D.S.O., A.D.C.
Captain J. H. F. Crombie, D.S.O., A.D.C.
Captain (Commodore Second Class) P. G. L. Cazalet, D.S.O., D.S.C., A.D.C.
Captain C. F. W. Norris, D.S.O.
Captain (Commodore Second Class) P. S. Smith, D.S.O.
Captain (Commodore Second Class) G. W. Simpson, C.B., C.B.E.

On promotion, Rear-Admirals Micklethwait, Crombie, Cazalet and Smith remain in their present appointments until relieved.

To be placed on the Retired List in the rank of Captain :—

Captain R. M. Southern, A.D.C.
Captain W. P. Carne, A.D.C.
Captain R. M. T. Taylor, A.D.C.
Captain R. Oliver-Bellasis, C.V.O., A.D.C.
Captain S. V. Jephson, A.D.C.
Captain H. T. T. Bayliss, D.S.O.
Captain J. A. Grindle, C.B.E.
Captain R. L. M. Edwards, C.B.E.
Captain J. A. McCoy, D.S.O.
Captain C. L. Firth, D.S.O., M.V.O.
Captain W. R. C. Leggatt, D.S.O.
Captain (Commodore Second Class) W. A. Dallmeyer, D.S.O.

The following promotions were made to date 30th June, 1950 :—

Commander to Captain.—R. H. Maurice, H. W. S. Sims-Williams, C. H. Hutchinson, R. A. Villiers, J. F. Cochrane, E. G. Roper, A. G. Forman, R. M. Smeeton, H. G. T. Padfield, R. F. Leonard, R. E. Washbourn, W. G. Parry, D. G. Goodwin, A. R. Hezlet, G. L. Farnfield, J. B. Frewen, D. H. F. Hetherington.

COMMANDER (E) TO CAPTAIN (E).—I. O. Backhouse, S. A. Harrison-Smith, S. A. MacGregor, G. C. de Jersey, N. J. Clift.

SURGEON COMMANDER TO SURGEON CAPTAIN.—G. Phillips.

ACTING INTERIM SURGEON COMMANDER TO SURGEON COMMANDER.—J. M. Fitzpatrick, I. Whittington, W. H. C. Watson, C. J. P. Pearson, I. C. Macdonald, P. G. Burgess, F. W. Baskerville, W. H. C. M. Hamilton.

SURGEON COMMANDER (D) TO SURGEON CAPTAIN (D).—R. J. M. Andrews (Acting Surgeon Captain (D)).

COMMANDER (S) TO CAPTAIN (S).—T. P. G. Bennett, D. S. Wareham.

FLEET CHANGES, EXERCISES AND CRUISES

CRUISER CHANGES.—The following changes in cruiser dispositions were announced on 17th April: H.M.S. " Superb "—flagship of the Second Cruiser Squadron, will undergo a refit from late July, and in November will relieve H.M.S. "Glasgow " for about a year on the America and West Indies Station. H.M.S. " Swiftsure " will become flagship of the Second Cruiser Squadron. H.M.S. "Glasgow " will return to the United Kingdom in November, refit and reduce to the reserve. H.M.S. " Sheffield," now refitting, will be commissioned for service in the Home Fleet and is expected to join the Second Cruiser Squadron early in 1951.

HOME FLEET SUMMER CRUISE.—Western Union exercises, with the code name " Activity," took place between 22nd and 30th May during the Home Fleet's Summer programme. British, French and Dutch ships took part under the overall command of Vice-Admiral J. J. L. Willinge, Royal Netherlands Navy. The Home Fleet then worked gradually West-about round Scotland, and early in July visited ports in Scandinavian Countries, the Netherlands, Belgium and Germany.

SUBMARINE EXERCISES.—Between 1st and 17th June, the annual large scale Summer exercise for submarines, surface vessels and aircraft under the direction of the Flag Officer, Submarines, Rear-Admiral S. M. Raw, C.B.E., took place in the North-West Approaches between North-West Scotland and Ireland. Fifteen submarines of home-based flotillas were engaged with three aircraft carriers, one cruiser, two depot ships, 17 destroyers, 12 frigates, and aircraft of the Home Fleet, together with ships of training flotillas from Portsmouth, Portland and Londonderry and aircraft of Coastal Command, R.A.F.

MEDITERRANEAN.—A squadron of the Mediterranean Fleet, under Rear-Admiral Guy Grantham, C.B., C.B.E., D.S.O., Flag Officer (Air) and Second-in-Command, Mediterranean, visited Greece and took part in exercises with units of the Royal Hellenic Navy. Admiral Sir John Edelsten, K.C.B., C.B.E., who succeeded Admiral Sir Arthur Power, G.C.B., G.B.E., C.V.O., as Commander-in-Chief, Mediterranean, on 14th May, arrived at Haifa on 26th June in the frigate " Surprise " on a two-day courtesy visit to the Government of Israel—the first to be made by a British service chief to the new State.

FAR EAST.—On 12th May, the destroyer " Cossack " (Captain R. T. White, R.N.), recovered the British steamship " Ethel Moller " near Chapel Island, off the mainland near Amoy. The steamship had been seized by Chinese Nationalists ten weeks earlier when attempting to reach Amoy, and had apparently been operated by them. Nationalist soldiers found on board were disarmed. In June, the frigate " Whitesand Bay " (Commander J. V. Brothers, R.N.) sent a doctor and medical party to the British steamship " Cheung Hing " off the China coast after six people were killed and seven wounded when Chinese Nationalists opened fire on the ship. The " Cheung Hing " was bound from Amoy to Hong Kong with 100 passengers.

AMERICA AND WEST INDIES.—The frigate " Bigbury Bay " (Lieutenant-Commander G. R. P. Goodden, R.N.) returned to Portsmouth on 11th May from an eventful commission. In 1947, while serving with the Far Eastern Fleet, she took 13 Japanese war criminals to Hong Kong for trial. She was transferred to the Mediterranean, and in July, 1948, to the America and West Indies Squadron. During her commission she

steamed 47,939 miles, visited twenty Countries and 54 ports. In Antarctic waters she encountered 1,200 icebergs, 350 of them within three days, including one that was four miles long.

Personnel

Reserve Fleet Divisions.—From 1st July, officers and men serving in the Reserve Fleet have their own name ship in each Division. The object is to preserve and further the entity of the Division and simplify internal organization. The name ships are: Portsmouth, H.M.S. "Bellerophon"; Clyde Area, H.M.S. "Jupiter"; Harwich, H.M.S. "Mars"; Plymouth, H.M.S. "Orion"; Sheerness, H.M.S. "Minerva"; and Chatham, H.M.S. "Neptune."

Recruiting.—The First Lord of the Admiralty—Viscount Hall, speaking at the annual meeting of King George's Fund for Sailors on 24th April, said that he had no fear of the future of the Royal Navy so far as manpower was concerned. Regular recruiting was not unsatisfactory. The Navy was able to reduce the intake of National Service men to a very small number, and the young men coming in could be trained for regular service.

National Service Intake.—On 8th June, the Admiralty announced that the intake of National Service men during the current financial year would be restricted to 2,000. About 80 per cent. of this entry will be required for men who enrol prior to National Service in the R.N.V.R., R.N.V.R. (Air) Squadrons, R.N.V.(W.)R., or the R.M.F.V.R. In general, therefore, young men desiring to serve in the Navy during their time of National Service should apply to join one of these Reserves.

Tobacco Cut.—A Fleet message circulated on 19th April, notified a cut of 20 per cent. in the issue of duty-free tobacco by ships and naval establishments at home. An Admiralty spokesman explained that a considerable proportion of the Customs privileges enjoyed by the Navy were not strictly covered by statutory authority, although derived from an Act of nearly a hundred years ago.

French Prize Money.—About 650 officers and men who were serving in the British aircraft carrier "Hermes" on 25th October, 1939, or the relatives of those who have since died, are to share in a French Government award of 617,000 francs (about £629 at the present rate of exchange) for the assistance rendered by the "Hermes" in the capture of the German steamship "Santa Fe" off Sierra Leone. Individual amounts are not large, varying between £8 for the Captain of the ship and 5s. for ordinary ratings, but they represent a gesture by the French which is appreciated and typical of the spirit of the Western Union.

Instructor Branch Commissions.—The Admiralty announced on 9th June that applications are invited from University graduates and qualified teachers under 36 years of age for Commissions in the Instructor Branch, Royal Navy. Requirements are for officers with qualifications in mathematics, science (physics, chemistry or metallurgy) or engineering. Commissions will be for three, four or five years, and after two years service opportunities will be afforded for officers to transfer to the Permanent List. Particulars and application forms may be obtained from the Director (P), Education Department, Admiralty, London, S.W.1.

Women's Royal Naval Service

Commandant's Visit.—Early in May, H.R.H. the Duchess of Kent, Commandant of the Women's Royal Naval Service, made her first visit to the W.R.N.S. quarters at St. Budeaux, where Wrens employed at naval establishments in the Plymouth area are accommodated. She also visited the R.N. Air Station, Culdrose, Cornwall, and saw Wren telegraphists and meteorologists at work in the airfield control tower and air mechanics and radio mechanics employed on "Firefly" aircraft.

Director.—On 21st June it was announced that Superintendent Mary K. Lloyd, O.B.E., is to be Director of the Women's Royal Naval Service in succession to Dame

Jocelyn M. Woollcombe, D.B.E., the appointment to take effect on 22nd November, 1950. Miss Lloyd has served at the Admiralty with the title of Assistant Director, W.R.N.S., and in December, 1949, she was promoted Superintendent and took charge of training and drafting at H.M. Training Establishment " Dauntless." She was educated at the Ursuline College and is a sister of Captain F. B. Lloyd, O.B.E., R.N.

Material

H.M.S. " Ark Royal."—The new aircraft carrier " Ark Royal " was launched by Her Majesty the Queen on 3rd May, from the Cammell Laird shipyard at Birkenhead. At the luncheon afterwards, Sir Robert Johnson, Chairman of Cammell Laird and Company, said they hoped to finish the vessel in a little over two years time. While only slightly longer than the previous " Ark Royal," launched from the same yard in 1937, she was almost double her displacement, and her horse-power and fuel capacities were much greater. She would carry a large number of guns, mostly anti-aircraft guns, and every modern appliance had been incorporated in her design.

H.M.S. " Diamond."—The third of the " Daring " class destroyers under construction, H.M.S. " Diamond," was launched on 14th June at the John Brown shipyard at Clydebank. The fourth, H.M.S. " Defender," was launched on 27th July, at Glasgow. Four more of the class are on the stocks. All eight are expected to be in service by 1952. These ships are of all-welded construction; they displace 2,600 tons (3,500 tons fully loaded); the extreme length is 390 feet and beam 43 feet. The armament includes six 4.5-in. and six other guns, and two Pentad torpedo tubes above water.

Future Destroyer Design.—Speaking after the ceremony, Vice-Admiral Denny —Third Sea Lord, said that these destroyers, the largest ever built for the Royal Navy, represented the most comprehensive and capable ships which human ingenuity could devise. But they might be the last which could be recognised as conventional destroyers. Smaller and lighter ships capable of dealing with any submarine threat would be built instead.

H.M.S. " King George V."—The Reserve Fleet battleship " King George V " left Portsmouth on 14th June in tow for the Gare Loch in the Clyde to be laid up. She has been sealed up for preservation, and is the first big ship to be treated in this way.

Surveying Ship.—Lady Moore, accompanied by Admiral Sir Henry Moore, Commander-in-Chief, The Nore, performed the keel-laying ceremony at Chatham Dockyard on 5th July of a new surveying ship. The new vessel, which will be equipped with the latest hydrographic survey apparatus, is the first of its class to be constructed entirely of prefabricated parts.

The new Surveying Ship " Cook " was accepted into the Service on 20th July.

Exhibition Ship.—The aircraft carrier " Campania," from the Reserve in the Gare Loch, has been lent for about two years to the Festival of Britain, 1951, as an exhibition ship, and displays based on those which will be seen on the South Bank of the Thames will be installed on board. The " Campania " will fly the Red Ensign, will be manned by a Merchant Navy crew, and will be managed on behalf of the Festival authorities by Messrs. Furness Withy and Co. It is expected that more than 2,000 visitors will be taken on board at a time, and the ship will visit a number of ports, including Southampton, Dundee, Newcastle, Hull, Plymouth, Avonmouth, Cardiff, Belfast and the Clyde.

Bermuda Dockyard.—On 12th April, it was announced that H.M. Government had decided with regret that there was no economically justifiable alternative to the complete closure of Bermuda Dockyard. The composition and strength of the America and West Indies Squadron will not be affected by this decision, but in future the Squadron will be maintained by ships from the Home Fleet, and refits and repairs will normally be carried out in the United Kingdom. The Squadron will continue to use Bermuda as its headquarters, and the Commander-in-Chief's residence, together with the necessary recreational facilities for the ships' companies, will be retained in Bermuda. In this way, the traditional association of the Royal Navy with Bermuda will be preserved.

MACHINERY RESEARCH CONTRACT.—In view of the need for research in regard to future naval requirements, the Admiralty have placed a contract with Messrs. Yarrow and Co. to investigate, in association with the English Electric Company, in what direction future machinery designs for naval vessels should be developed. The investigation will cover a wide field, including a world survey of existing design. Close co-operation between the Admiralty and Messrs. Yarrow and Co. and the English Electric Company will be maintained throughout this work.

NAVAL AVIATION

NIGHT JET CARRIER LANDINGS.—On 20th June, two pilots of No. 702 Naval Air Squadron successfully landed "Vampire" jet fighters in H.M.S. "Theseus," the first night deck landings to be made with jet aircraft. The pilots were Lieutenant A. B. B. Clark, R.N., and Lieutenant N. Perrett, R.N., who between them made five successful landings. The deck of the "Theseus" had only small side lights along the runway, and the aircraft landed following instructions signalled to them by a batsman raising illuminated bats.

RECORD IN DECK LANDINGS.—Lieutenant-Commander J. S. Bailey, O.B.E., R.N., recently made his 2,000th landing on the deck of an aircraft carrier, after flying off a "Seafire" from H.M.S. "Illustrious." This is believed to be a world record. In the course of his naval flying career Lieutenant-Commander Bailey has deck-landed eighteen different types of aircraft. Many of these landings were made during war operations, but some in demonstration and experimental flights.

ROYAL NAVAL VOLUNTEER RESERVE

SUMMER EXERCISES.—The most extensive programme of exercises and visits to foreign ports for R.N.V.R. Divisions and Air Squadrons has been taking place this Summer. Four Divisions—Tyne, Mersey, Solent and Humber, have made visits to Continental ports. The motor minesweeper "Bernicia," attached to the Tyne Division, visited Norway in June. The motor minesweeper "Mersey," attached to the Division of that name, went to Nantes and St. Nazaire. Three motor launches from the Solent Division visited Bordeaux, La Rochelle and St. Malo. H.M.S. "Humber," seagoing tender of her division, made a two weeks cruise to five Norwegian and Danish ports. R.N.V.R. Air Squadrons have also been undergoing extensive Summer training. They co-operated in one stage of the Submarine exercise in the North-West Approaches, making air strikes over 150 miles from base against units of the Home Fleet, including aircraft carriers and smaller ships. One squadron in June flew on to the light fleet carrier "Theseus" in the English Channel for a period of service afloat. The R.N.V.R. Air Squadrons are manned at present by officers who gained their flying experience in the War, but in future their strength will be maintained by the enrolment of young men who qualify as commissioned pilots and observers in the R.N. during their eighteen months period of National Service.

ROYAL MARINES

PROMOTION.—Colonel W. I. Nonweiler, C.B.E., R.M., to be Major-General (25th May, 1950).

BEATING RETREAT.—Over 250 musicians of the Massed Bands of the Royal Marines from the Chatham, Portsmouth and Plymouth Groups and the Royal Naval School of Music at Deal beat "Retreat" on the Horse Guards Parade, Whitehall, on 23rd and 24th June. They were under the command of Major F. Vivian Dunn, M.V.O., A.R.A.M., R.M., Director of Music of the Portsmouth Group.

VISIT TO VAAGSO.—On 20th May, as a climax to their Winter study of commando raids, a party of 50 R.M. officers, led by Colonel J. L. Moulton, D.S.O., O.B.E., R.M., visited the scene of the successful raid on Vaagso, Norway, by No. 3 Commando in December, 1941. The party sailed from Rosyth in H.M.S. "Suvla," which for the period of the trip was turned into a "School of Raiding" with lecture and model rooms in her

tank space. Officers from Combined Operations Headquarters were present as instructors and directing staff. The visit was officially known as " Midnight Oil IV."

COMMANDO EXERCISE.—On the night of 10th May, Royal Marines from the Commando School at Bickleigh, Devon, scaled the high rocky cliffs near Salcombe, Devon, during an exercise known as " Midnight Oil III." Marines from the Amphibious School at Fort Cumberland, Southsea, made the initial landing in canoes to set up guide lamps for the assault troops, and the Commandos disembarked on the rocky foreshore, in total darkness. On the following day a similar exercise took place in daylight to enable spectators, who included the Commandant General, Royal Marines, Lieut.-General Sir Leslie Hollis, K.B.E., C.B., and representatives from Combined Operations Headquarters to view the technique employed.

FAREWELL TO CHATHAM.—On 27th May, a farewell parade of the King's and Regimental Colours of the Royal Marines, Chatham Division, took place. Major-General R. A. R. Neville, C.B.E., R.M., Officer Commanding the Chatham Group, took the salute. On Sunday, 28th May, the Colours were marched to Rochester Cathedral for laying up. In his sermon the Dean of Rochester, the Very Rev. T. Crick, a former Chaplain of the Fleet, said he hoped that some time in the very near future another Dean might have the pleasure of handing the Colours back to the Marines.

DOMINION AND COMMONWEALTH NAVIES

CANADA

FIRST SEA LORD'S VISIT.—On the conclusion of his visit to Ottawa in April, the First Sea Lord—Admiral of the Fleet Lord Fraser of North Cape, G.C.B., K.B.E., said that the British, Canadian and American naval authorities were working together in developing anti-submarine methods and he believed that they were keeping pace with such developments as were involved in new submarine building.

A/S TRAINING.—H.M. Submarine " Astute " was made available to the Royal Canadian Navy and R.C.A.F. for anti-submarine training and was based on Halifax from 10th April to 1st July. Mr. Claxton, the Canadian Minister of National Defence, has announced that the Grumman " Avenger " aircraft had been adopted for anti-submarine work and negotiations had been completed for the purchase of machines from the United States Government.

EUROPEAN CRUISE.—On 13th June, Canadian Naval Headquarters announced that Rear-Admiral E. R. Mainguy, O.B.E., R.C.N., will command as Flag Officer the Canadian Special Squadron which will make a three months cruise to Europe this Autumn. He will embark in H.M.C.S. " Magnificent " at Londonderry in mid-September and will fly his flag in the carrier for the balance of the cruise. After two weeks anti-submarine training with the Joint A/S School at Londonderry, the Canadian ships will visit a number of ports on the Continent. During Rear-Admiral Mainguy's absence, Commodore A. M. Hope, Commanding the R.C.N. Barracks, will act as Flag Officer, Atlantic Coast.

AUSTRALIA

BIRTHDAY HONOUR.—The following was among the honours conferred on the observance of the King's Birthday on 8th June :—

C.B.E.—Engineer Rear-Admiral J. W. Wishart, O.B.E., R.A.N.

PROMOTION.—On 15th May, Mr. Francis, Minister for the Army and Navy, announced that Rear-Admiral J. A. Collins, First Naval Member of the Australian Naval Board, had been promoted to Vice-Admiral. He is the first graduate of the Royal Australian Naval College to attain this rank. When in command of the cruiser " Sydney " in 1940, Vice-Admiral Collins was awarded the C.B. for the destruction of the Italian cruiser " Bartolomeo Colleoni." In 1945 he was severely wounded while commanding H.M.A.S. " Australia " when she was hit by a Japanese suicide bomber.

APPOINTMENTS.—Rear-Admiral G. D. Moore, R.A.N., Officer in Charge of New South Wales Naval Establishments since 1944, has been appointed first Australian Minister to the Philippines.

Captain R. R. Dowling, R.A.N., has been appointed Second Naval Member of the Australian Naval Board, with the rank of Commodore, in succession to Rear-Admiral H. A. Showers, R.A.N., who becomes Flag Officer in Charge, Sydney.

Captain G. H. Beale, R.N., has been lent to the Royal Australian Navy and appointed to the R.A.N. Air Station, Nowra, in command.

NEW CARRIER AIR GROUP.—The formation of No. 21 Carrier Air Group for the R.A.N., consisting of Nos. 808 and 817 Squadrons equipped with " Sea Fury " and " Firefly " aircraft respectively, was marked by a ceremony on Anzac Day, 25th April, at the R.N. Air Station at St. Merryn, Cornwall. After training in British waters the Group—the second formed for the R.A.N.—was to embark in H.M.A.S. " Sydney " on her arrival at Portsmouth in July and continue training on board before sailing for Australia in October.

DESTROYER CONVERSIONS.—On 1st June, Mr. Menzies, the Australian Prime Minister, announced that the destroyers " Quality," " Quiberon," " Quickmatch," " Quadrant " and " Queenborough," which had been on loan to the R.A.N. since 1945, were to be transferred permanently, without charge, to the Commonwealth Government. They will be converted into anti-submarine frigates, at a cost of about £A400,000 for each ship.

NEW ZEALAND

MEDITERRANEAN EXCHANGE.—The New Zealand frigates " Taupo " and " Hawea " arrived on the Mediterranean Station in May for a six-month period of operations with the Second Minesweeping Flotilla at Malta. Their place in New Zealand waters is being taken by two frigates from the Mediterranean—the " St. Austell Bay " and the " Veryan Bay."

BIRTHDAY HONOUR.—The following was among the honours conferred on the occasion of the King's Birthday on 8th June :—

C.B.—Captain (Commodore, 2nd Class) G. W. G. Simpson, C.B.E., R.N., on the advice of H.M. New Zealand Ministers.

Commodore Simpson has been First Naval Member of the New Zealand Naval Board since 1947.

APPOINTMENT.—Captain A. E. T. Christie, R.N., has been lent to the Royal New Zealand Navy and appointed to the " Philomel," in command, and as Naval Officer in Charge, Auckland.

PAKISTAN

INSPECTION.—At Portsmouth on 19th June, Mr. Habib I. Rahimtoola, High Commissioner for Pakistan, inspected H.M. Pakistan Ship " Sind." He was received by a guard of honour and afterwards addressed the ship's company. Before returning to London he had luncheon with the Commander-in-Chief, Portsmouth—Admiral of the Fleet Sir Algernon Willis. The " Sind " is an anti-aircraft frigate of 1,340 tons, built at Southampton in 1943.

INDIA

APPOINTMENT.—Captain E. G. McGregor, R.N., has been lent to the Indian Navy as Commodore, Second Class, and Commodore Superintendent of the Indian Navy Training Depot.

FOREIGN NAVIES

BRAZIL

TRAINING SHIP.—The four-masted Brazilian training ship " Almirante Saldanha," commanded by Captain Oswaldo de Alvarenga Gaudio, is visiting Great Britain during

her Summer cruise with a crew of 22 officers, 59 midshipmen under training, and 318 men. She was to be under repair at Barrow-in-Furness from June to August, and was to visit Portsmouth from 14th to 18th August and Newcastle from 18th to 22nd September. This is only the second time that a unit of the Brazilian Navy has visited the United Kingdom since 1936, the previous occasion being an earlier visit by the same training ship.

FRANCE

"JEAN BART."—The French battleship "Jean Bart," now completed, left Brest on 27th April on her first cruise off the coast of Brittany and to carry out gunnery practices before joining the naval squadron at Toulon.

CHERBOURG VISIT.—Admiral of the Fleet Sir Algernon Willis, Commander-in-Chief at Portsmouth, arrived at Cherbourg on 21st April in H.M.S. "Finisterre" for a formal visit to Admiral Barts, Commanding the First Maritime Region.

NAVY DAY.—The band of the Royal Marines from Deal visited Paris to take part in the observance of the French Navy Day on 4th June.

"IMPLACABLE" MEMENTO.—A casket fashioned from the original timbers of the former French ship of the line "Duguay Trouin," afterwards H.M.S. "Implacable," has been presented to the French Ambassador in London by the First Lord of the Admiralty.

NETHERLANDS

DESTROYERS FROM U.S.A.—Two destroyers of the U.S. Navy—the "Burrows" and "Rinehard," were formally transferred at Boston on 1st June to the Netherlands Government and commissioned in the Royal Netherlands Navy. They were the first to be transferred to a foreign government under the mutual Defence Assistance Programme. After being accepted by Rear-Admiral Jonkheer H. A. van Foreest, R.Neth.N., from Rear-Admiral Hewlett Thebaud, U.S.N., they were renamed the "Van Amstel" and "De Bitter."

NORWAY

PORTSMOUTH VISIT.—The destroyers "Oslo," "Bergen" and "Stavanger" arrived at Portsmouth on 24th April on an informal visit of five days. The ships, which were acquired from Great Britain, form the Norwegian Coastal Squadron and are commanded by Commodore Skule Storeheill, R.Nor.N.

UNITED STATES

NEW PACIFIC TASK FORCE.—Following the outbreak of hostilities in Korea, it was announced at Pacific Fleet Headquarters that a new task force to supplement the Seventh Fleet was being formed at Pearl Harbour. The aircraft carrier "Philippine Sea" will be the nucleus of the new force, which will include two cruisers, a squadron of destroyers, and a full train of supply ships.

SCHNORKEL CRUISE.—The submarine "Pickerel," fitted with the schnorkel apparatus, made a voyage of 21 days from Hong Kong to Pearl Harbour, a distance of 5,200 miles, without surfacing. The time during which the submarine relied on the schnorkel breathing apparatus was 505 hours. She dived off Hong Kong on 15th March and surfaced on 5th April. A Washington report said that this was believed to be the longest run ever made under water, but as a correspondent pointed out in *The Times* on 18th April, the British submarine "Alliance" made an under-water cruise of 30 days in November, 1947. She dived off Las Palmas and proceeded South across the Equator, then East, and finally North up to Freetown, West Africa, where she surfaced at the exact spot and time set previously by the Admiralty.

NEW SUBMARINES.—On 25th April, Admiral Sherman—Chief of Naval Operations, appeared before the House Armed Services Committee and requested authority to build four new type submarines, including one which would be propelled by atomic energy. This nucleur-powered submarine is to cost 40 million dollars. Under the current pro-

gramme, ten existing submarines are to be equipped with the " snort " breathing apparatus; one cruiser submarine is to be modernized, and another converted to a launching platform for guided missiles.

MEDITERRANEAN.—The U.S. Mediterranean Squadron, composed of the aircraft carrier " Midway," the heavy cruiser " Newport News," the light cruiser " Roanoke," six destroyers and a tanker, arrived at Lisbon on 12th May for the annual change over of the squadron, which took place this year not at Villefranche, as previously, but in the Tagus.

THE " MISSOURI " COURT-MARTIAL.—As a result of the Court-Martial in March which investigated the grounding of the battleship " Missouri " (see the May JOURNAL, page 329), it was announced on 3rd May that Captain William D. Brown, the Commanding Officer, had been reduced 250 numbers on the Navy's promotion list; Commander John R. Millett, operations officer, 100 numbers; and Lieutenant-Commander Frank G. Morris, navigator, 350 numbers.

SUBMARINE PLAQUE.—At the first anniversary dinner on 19th April of the London Chapter of the Fellowship of U.S.-British Comrades, the American Ambassador—Mr. Lewis Douglas, received from Colonel E. H. Golburn, Grenadier Guards, a signed photograph of Princess Elizabeth and a plaque. The latter is to be affixed to the new submarine " Grenadier," as a token of comradeship from the First Grenadier Regiment of Foot Guards, of which the Princess is Colonel.

ARMY NOTES

GREAT BRITAIN

H.M. The King

His Majesty was present at the King's Birthday Parade on Horse Guards Parade on 8th June, and took the Salute. He was accompanied by the Duke of Gloucester (Colonel, Scots Guards, Personal A.D.C.).

On 5th July The King presented Colours to the 3rd Battalion, Coldstream Guards, on Horse Guards Parade.

The King, who was accompanied by the Queen, presented Colours to each of the three Regular Battalions of the Parachute Regiment at Aldershot on 19th July.

The Duke of Gloucester, Colonel Scots Guards, visited the Guard's Depot at Caterham on 11th May.

On 16th May The Duke of Gloucester went to Bückeburg, Germany, by air, to visit The 10th Royal Hussars, 1st Battalion The Gordon Highlanders, 1st Battalion The Rifle Brigade and the Royal Army Service Corps, of all of which he is Colonel-in-Chief.

The Duke of Gloucester, as Colonel, inspected the 1st Battalion, Scots Guards, at Pirbright on 27th June.

On 21st July The Duke of Gloucester took the Salute at the Sovereign's Parade at the Royal Military Academy, Sandhurst.

On 24th May The Princess Royal received, on behalf of The Royal Scots, of which Her Royal Highess is Colonel-in-Chief, a presentation of Kukris from the 10th Princess Mary's Own Gurkha Rifles, to mark the affiliation of the two Regiments.

The Princess Royal, Colonel-in-Chief, Royal Corps of Signals, visited the Signals Research and Development Establishment at Christchurch on 17th July.

The Duchess of Gloucester unveiled the Aldershot Memorial Shrine on 5th May.

On 11th July the Duchess of Gloucester, as Colonel-in-Chief, visited the 5th Battalion (T.A.), The Northamptonshire Regiment, at Shorncliffe.

The Duchess of Kent was present, on 11th June, at the Service of Dedication of the Regimental Chapel of the Royal Fusiliers, at St. Sepulchre's Church, Holborn Viaduct.

To be Aide-de-Camp to the King.—Brigadier J. E. Witt, C.B.E., M.C., late R.A.S.C. (30th April, 1950), vice Colonel W. N. Craig-McFeely, retired.

To be Honorary Surgeon to the King.—Major-General J. M. MacFie, C.B.E., M.C., M.B., late R.A.M.C. (29th March, 1950), vice Major-General R. W. Galloway, C.B., C.B.E., D.S.O., M.B., retired.

To be Honorary Chaplain to the King.—The Reverend F. P. W. Alexander, O.B.E., Chaplain to the Forces, 1st Class, Royal Army Chaplain's Department (May, 1950).

To be Colonels Commandant.—Of The Royal Artillery, Lieut.-General Sir Frederick Wrisberg, K.B.E., C.B., late Royal Artillery (4th February, 1950), vice General Sir Robert H. Haining, K.C.B., D.S.O., tenure expired; Lieut.-General Sir Cameron G. G. Nicholson, K.B.E., C.B., D.S.O., M.C., late Royal Artillery (21st February, 1950), vice Lieut.-General Sir Robert H. Carrington, K.C.B., D.S.O., tenure expired; of the Royal Pioneer Corps, Lieut.-General Sir Frank E. W. Simpson, K.B.E., C.B., D.S.O., late Royal Engineers (1st May, 1950), vice Lieut.-Colonel (Honorary Brigadier) J. B. Hillary, C.B.E., resigned.

To be Colonels of Regiments.—Of the Cheshire Regiment, Major-General (Honorary Lieutenant-General) A. E. Percival, C.B., D.S.O., O.B.E., M.C., late Infantry, retired (27th May, 1950), vice Colonel (Honorary Brigadier) G. P. Harding, C.B.E., D.S.O., M.C., resigned.

EMERGENCY MEASURES

The War Office announce that as a result of the decision to send land forces to Korea the release of all Regular Army personnel, with the exception of National Service personnel and certain other categories mentioned below, will be temporarily suspended with effect from 1st August, 1950. In addition, there will be a limited selective call up of the Regular Army Reserve and the Regular Army Reserve of officers.

The above instructions apply to :—

(i) *Regular Officers* : All voluntary retirement suspended unless already approved by the War Office.

(ii) *Short Service Officers with a reserve liability.*

(iii) *Regular Other Ranks* : Except those who are due to be released on pension.

(iv) *Short Service engagements.*

(v) *Discharge by Purchase* : Suspended except on compassionate grounds.

Appeals by any of the above on grounds of exceptional hardship will be referred to the War Office and considered on their merits.

None of the above apply to the Womens' Services, for which instructions will be issued separately.

Army Council

The King has been pleased by Letters Patent under the Great Seal bearing the date 24th June, 1950, to appoint the following to be His Majesty's Army Council :—

Wing Commander the Right Honourable E. J. St. L. Strachey—*President.*
Captain R. M. M. Stewart—*Vice-President.*
Field-Marshal Sir William J. Slim, G.C.B., G.B.E., D.S.O., M.C.
General Sir James S. Steele, G.C.B., K.B.E., D.S.O., M.C.
General Sir G. Ivor Thomas, K.C.B., K.B.E., D.S.O., M.C.
Lieut.-General N. C. D. Brownjohn, C.B., C.M.G., O.B.E., M.C.
Lieut.-General Sir John F. M. Whiteley, K.C.B., C.B.E., M.C.
Sir George W. Turner, K.C.B., K.B.E.

Honours and Awards

The King's Birthday Honours.—The following were included in the King's Birthday Honours List, published on 8th June, 1950 :—

G.C.B.—General Sir James S. Steele, K.C.B., K.B.E., D.S.O., M.C., LL.D., A.D.C. (Gen.).

K.C.B.—Lieut.-General Sir Charles F. Keightley, K.B.E., C.B., D.S.O. ; General Sir G. Ivor Thomas, K.B.E., C.B., D.S.O., M.C.

C.B.—Major-General R. H. Bower, C.B.E. ; Major-General C. F. C. Coleman, D.S.O., O.B.E. ; Brigadier W. A. Ebsworth, C.B.E. ; Major-General C. B. Fairbanks, C.B.E. ; Major-General L. D. Grand, C.I.E., C.B.E. ; Major-General G. S. Hatton, D.S.O., O.B.E. ; Major-General G. W. Lathbury, D.S.O., M.B.E. ; Colonel R. G. Llewellyn, C.B.E., M.C., T.D., D.L. ; Major-General T. Menzies, O.B.E., M.B., K.H.P. ; Brigadier R. G. Thurburn, C.B.E. ; Major-General G. N. Tuck, O.B.E. ; Brigadier (temporary) L. F. E. Wieler, C.B.E.

K.C.M.G.—Major-General T. J. W. Winterton, C.B., C.B.E.

K.B.E.—Lieut.-General P. M. Balfour, C.B., C.B.E., M.C. ; Lieut.-General R. N. Gale, C.B., D.S.O., O.B.E., M.C. ; Lieut.-General H. C. H. Robertson, C.B.E., D.S.O.

Royal Red Cross First Class.—Lieut.-Colonel (temporary) Florence M. Lowther ; Major Elspeth J. Stirling.

Appointments

War Office.—Brigadier M. B. Dowse, C.B.E., appointed Director of Personal Services, with the temporary rank of Major-General (26th June, 1950).

Major-General E. M. Bastyan, C.B., C.B.E., appointed Director of Staff Duties (November, 1950).

UNITED KINGDOM.—Major-General L. G. Whistler, C.B., D.S.O., appointed Commander of a District and an Infantry Division (T.A.) (3rd July instead of May, 1950, as previously reported).

Major-General F. W. Festing, C.B., C.B.E., D.S.O., appointed President, The Regular Commissions Board (October, 1950).

Colonel (temporary Brigadier) C. H. Norton, C.B.E., D.S.O., appointed Commander 5th Anti-Aircraft Group, with the temporary rank of Major-General (October, 1950).

Major-General L. K. Lockhart, C.B., C.B.E., M.C., appointed Commander, Salisbury Plain District (November, 1950).

Major-General W. P. Oliver, C.B., C.B.E., appointed Chief of Staff, Eastern Command (December, 1950).

Major-General R. A. Hull, C.B., D.S.O., appointed Chief Army Instructor, Imperial Defence College (December, 1950).

Major-General F. R. G. Mathews, C.B., D.S.O., appointed Commander, 1st Infantry Division (December, 1950).

Colonel (temporary Brigadier) P. N. White, C.B.E., appointed Chief of Staff, Northern Command, with the temporary rank of Major-General (January, 1951).

GERMANY.—Major-General J. M. Kirkman, C.B., C.B.E., appointed Chief of the Intelligence Division, Control Commission for Germany (December, 1950).

AUSTRIA.—Colonel (temporary Brigadier) M. M. Alston-Roberts-West, D.S.O., appointed G.O.C.-in-C., B.T.A., with the temporary rank of Major-General (31st July, 1950).

MIDDLE EAST LAND FORCES.—Brigadier R. L. Scoones, D.S.O., O.B.E., appointed officiating Major-General Commanding Troops, Sudan, with the temporary rank of Major-General (9th May, 1950).

Brigadier J. E. Witt, C.B.E., M.C., A.D.C., appointed Director of Supplies and Transport, with the temporary rank of Major-General (July, 1950).

FAR EAST LAND FORCES.—Colonel (temporary Brigadier) J. H. N. Poett, D.S.O., appointed Chief of Staff, with temporary rank of Major-General (24th July, 1950).

SPECIAL APPOINTMENTS.—Brigadier R. D. Cameron, C.B.E., M.C., M.B., appointed a Director of Medical Services, with the temporary rank of Major-General (3rd April, 1950).

Major-General V. Blomfield, C.B., D.S.O., to be specially employed (1st June, 1950).

PROMOTIONS

Generals.—Lieut.-Generals to be Generals: Sir Frank E. W. Simpson, K.B.E., C.B., D.S.O. (18th March, 1950); Sir Gerald W. R. Templer, K.B.E., C.B., C.M.G., D.S.O. (4th June, 1950).

Lieut.-General.—Major-General to be Lieut.-General: C. F. Loewen, C.B., C.B.E., D.S.O. (27th May, 1950).

Major-General.—Temporary Major-General or Brigadier to be Major-General: C. G. B. Greaves, C.B., C.B.E. (27th May, 1950).

The following Brigadiers or Colonels to be temporary Major-Generals: R. D. Cameron, C.B.E., M.C., M.B. (3rd April, 1950); R. L. Scoones, D.S.O., O.B.E. (9th May, 1950); M. B. Dowse, C.B.E. (26th June, 1950); J. H. N. Poett, D.S.O. (24th July, 1950); M. M. Alston-Roberts-West, D.S.O. (31st July, 1950).

Retirements

The following General Officers have retired : General Sir William D. Morgan, G.C.B., D.S.O., M.C. (4th June, 1950) ; General Sir Sidney C. Kirkman, K.C.B., K.B.E., M.C. (22nd July, 1950).

North Atlantic Treaty Organization

Visit to Denmark.—The Army Advisory Committee of the Northern European Regional Planning Group, North Atlantic Treaty Organization, held a meeting in Copenhagen on 15th May. The Countries represented were the United Kingdom, Denmark and Norway, and United States observers also attended. The British representative on this Committee is Brigadier F. C. Curtis, Director for European Inter-Allied Planning at the War Office. The agenda included questions concerning the harmonization of training, organisation and staff systems.

Visit to Norway.—The Committee visited Norway from 1st to 12th July. The intention of this visit was to get a first hand impression of Norway and Norwegian Military affairs.

Staff College, Camberley

A list of the officers who qualified in the Staff College entrance examination held in February, 1950, was published in *The Times* of 22nd June.

Troop Movements

It was announced by the Minister of Defence on 2nd May that it had been decided to move the 13th/18th Hussars from the Middle East to Malaya, to assist in the anti-bandit operations.

On 23rd May the War Office announced that it is planned to bring both the 2nd Battalion, Coldstream Guards, and the 2nd Battalion, Scots Guards, at present serving in Malaya, back to the United Kingdom within the next fourteen months in the normal course of routine reliefs. The announcement added that the total number of Guards' battalions serving abroad will remain the same, and that there is no intention of sending any Guard's battalions to the Caribbean.

Tattoos

Aldershot Tattoo.—The Aldershot Tattoo is to be revived next year on a pre-war scale as the contribution of Southern Command to the Festival of Britain. The tattoo will take place in its former home, Rushmoor Arena, which is now being prepared. There will be five night performances from 26th to 30th June, with a daylight rehearsal on 23rd June. Seating accommodation will be provided for 80,000 people at each performance. The proceeds will go to military charities, and no expense will fall on public funds.

Tattoos on Horse Guards Parade.—Army Tattoos took place on Horse Guards Parade on the last four Saturday evenings of July. Those taking part included, in order of appearance, motor-cyclists of the Motor-Cycle Troop of the Signal Regiment of the 56th Armoured Division (T.A.) ; the massed Drums and Pipes of the Brigade of Guards ; the King's Troop, R.H.A. ; the massed Bands of the Brigade of Guards ; and Troops of The Household Cavalry. The programme lasted from 8 p.m. to 9.10 p.m. and was preceded at 7.30 p.m. by the Band from the Royal School of Music, Kneller Hall, the Royal Artillery Band or that of the Coldstream Guards, which played until 8 p.m.

Territorial Army

First Intake of National Service Men.—On 22nd June, the principal units of the Territorial Army received the first intake of National Service men who had completed eighteen months training in the Regular Army.

Training.—Approximately 1,500 officers and men of the 56th (London) Armoured Division (T.A.) were at one time in camp on the verges of the Stanford training area in May. This was the first occasion in peace-time that any Territorial Division has trained in one area.

STRENGTH.—The total strength of the Territorial Army, including the Women's Royal Army Corps (T.A.), but excluding the Regular Army cadre serving with T.A. units, at the end of April, May and June, 1950, was as follows :—

April	...	...	88,505
May...	...	...	88,700
June	...	...	89,581

SKILLED TRADESMEN WANTED FOR R.E.M.E.

The Corps of the Royal Electrical and Mechanical Engineers is looking for first class men between 20–35 years of age, in certain highly skilled trades, to become Armament Artificers Staff Serjeants. These men will undergo brief military and full technical training with promotion to Armament Artificer after 18 months technical course. A man becomes a Serjeant six weeks after he joins, and receives the pay of that rank until he becomes an Armament Artificer Staff Serjeant.

The pay after his initial six weeks training is 13s. 6d. a day, and after 18 months technical training 16s. od. a day. Staff Serjeants R.E.M.E. are eligible for promotion to W.O. Class I and a Commissioned Rank as Assistant Electrical and Mechanical Engineer.

Marriage allowance is 40s.–45s. a week, rations and clothing free. Men engage initially for 12 years but their service may be extended up to 22 years. An Armament Artificer is eligible for pension after 22 years.

WAR MEMORIALS

3RD CARABINIERS (PRINCE OF WALES' DRAGOON GUARDS).—On 15th April, a Memorial to men of the 3rd Carabiniers (Prince of Wales' Dragoon Guards), who lost their lives between 1939 and 1945, was unveiled by Field-Marshal Sir William Slim, Chief of the Imperial General Staff, at Perham Down, near Andover.

ROYAL ARTILLERY.—Field-Marshal Lord Alanbrooke, the Master Gunner, opened 24 houses at Artillery Place, Headstone Lane, Harrow, on 3rd June, as part of the Royal Artillery War Memorial to its 30,000 members who fell in the war.

THE ESSEX REGIMENT.—Memorial gifts to the Chapel of The Essex Regiment at Warley Barracks, Brentwood, were dedicated by the Bishop of Chelmsford on Sunday, 2nd July. A chime of 13 bells is part of the Memorial to over 1,000 members of the Regiment who died in the 1939–45 War.

THE LOYAL REGIMENT.—A Memorial Chapel and Book of Honour, in remembrance of 1,200 men of The Loyal Regiment who fell in the 1939–45 War, were dedicated by the Bishop of Blackburn at Preston Parish Church on 3rd June.

THE DURHAM LIGHT INFANTRY.—The Durham Light Infantry War Memorial Garden, in the precincts of Durham Cathedral, to the memory of the 3,000 men of the Regiment who died in the 1939–45 War, was dedicated on 9th July.

ARMY CATERING CORPS.—A Memorial to the 775 men of the Army Catering Corps who lost their lives in the 1939–45 War, was dedicated by the Bishop of Guildford, in St. Georges' Garrison Church, Aldershot, on 9th July.

RESTORATION OF A STATUE OF EARL HAIG IN FRANCE

In 1931 the people of Montreuil-sur-Mer erected a statue of Earl Haig in their little town in Northern France where the Field-Marshal had set up British General Headquarters in the 1914–1918 War. The statue was executed in bronze by the sculptor Landowski and showed the Field-Marshal astride his favourite mare, Miss Ypres.

In 1940 the Germans melted down the statue but left undamaged the concrete plinth on which it stood. Each year during the occupation of France, the people of Montreuil would assemble on Armistice Day before the concrete pedestal and pay homage to a great Commander.

In 1945 a public subscription was opened to raise funds for the restoration of the statue. Bronze for it was taken from captured German guns, and the necessary money was soon collected. Fortunately, the mould for the original figure had been preserved by the sculptor and from this the new statue was cast.

On 25th June, 1950, Sir Oliver Harvey—the British Ambassador in Paris, and M. Phalempin, who represented the French Government, unveiled the restored statue before a large crowd in the market place at Montreuil. In this cobbled square were assembled detachments of French soldiers and of those British Regiments with which the Field-Marshal had been closely associated—Royal Horse Guards, the 17/21 Lancers, and the King's Own Scottish Borderers. There were also representatives from the Army Council, the Dominions, the British Legion and delegates of the Franco-British Society. The present Earl Haig, the son of the Field-Marshal and the latter's daughters were also present.

To close the ceremony the military detachments marched past the British and French authorities. This small parade was led by the band of the 7th Hussars and proudly in the rear marched French and British veterans of the first World War.

Perhaps the most moving feature of the whole ceremony was the depth of sincerity underlying the genuine desire for close Anglo-French understanding and friendship. Both the British Ambassador and the Prefect of the Pas de Calais emphasized the importance of this in the speeches they delivered.

Miscellaneous

Tour of the C.I.G.S.—Field-Marshal Sir William Slim, Chief of the Imperial General Staff, left England on 2nd June on tour to Egypt, Australia and New Zealand. On his return journey he spent a few days in Malaya and Pakistan, staying a week-end in Delhi en route as the guest of the Government of India.

Army Day in London.—Army Day in London took place on 7th May. The parade and march took place but, owing to bad weather, the drumhead service, which was to have been held in Hyde Park, was cancelled. Field-Marshal Sir William Slim took the Salute during the march.

Presentation of New Colours.—New Colours were presented to the 1st Battalion, The Duke of Cornwall's Light Infantry, by Lieut.-Colonel E. H. W. Bolitho, Lord Lieutenant of Cornwall, at Quebec Barracks, Bordon Camp, on 9th June. It was the first time that the Colours of the 1st and 2nd Battalions, which were amalgamated at the ceremony, had been on parade together. The new Colours were consecrated by the Chaplain-General to the Forces—Canon F. Le Hughes.

Artillery Demonstration.—Some thousands of officers, cadets and other ranks of the British fighting Services, officers from the Dominions and the United States and other Nations, witnessed the annual Artillery Demonstration "Scapa," given by the School of Artillery, on Salisbury Plain, on 9th May.

Bisley.—The K.R.R.C. Cup, the Unit Championship of the British Army, was won by the 1st Battalion, The Rifle Brigade.

Major R. M. Parsons, Royal Ulster Rifles, won the King's Medal in the Army Championship for the second year in succession. He was also awarded the Watkin Cup and the A.R.A. Gold Jewel.

Lieut.-Colonel B. D. Shaw, Nottingham University Training Corps, won the King's Medal for the best shot in the Territorial Army.

The Regular and Territorial Cup was won by Captain W. H. Baudains, Royal Ulster Rifles.

The Ashburton Shield was won by The Leys School.

DOMINIONS AND COLONIES

CANADA

ROYAL COLONELS-IN-CHIEF.—The King has been graciously pleased to approve the appointments of H.R.H. The Princess Elizabeth, Duchess of Edinburgh, K.G., C.I., as Colonel-in-Chief of The Argyll and Sutherland Highlanders of Canada, with effect from 17th May, 1950; and of H.R.H. The Duke of Gloucester, K.G., K.T., K.P., G.C.B., G.C.M.G., G.C.V.O., as Colonel-in-Chief of The Royal Winnipeg Rifles, with effect from 10th May, 1950.

ARMY STAFF COLLEGES.—Four Canadian Army officers have been selected to attend forthcoming courses in England, Australia and India, and 36 others will attend the Canadian Army Staff College at Kingston next year.

JUNIOR OFFICERS' COURSE AT THE ROYAL MILITARY COLLEGE.—The second annual common-to-all-arms Summer Course for newly-appointed subalterns of the Canadian Army of the Royal Military College, Kingston, consists of 122 students. Corps Directors are visiting the Course periodically to lecture on the functions, organization and peace and war roles of their respective Corps.

R.C.E.M.E. UNITS.—As a result of recent reorganization, R.C.E.M.E. units have been grouped into eight technical regiments and 21 independent squadrons.

RESERVISTS TRAINING EASED BY AIR TRAVEL.—Arrangements have been made this year, especially in eastern Canada, for reservists to travel to their training areas by air, thus saving the time previously taken to cover long distances, and giving the men experience in air travelling.

Attendance at Canadian Army Reserve Force Summer Camps is increasing. It is estimated that 15,000 will have attended before next September whereas last year the number was 11,000.

OFFICER CADET TRAINING.—Cadets from 28 Universities, totalling approximately 2,400, are undergoing the practical phase of their training at various Active Force establishments this Summer. The complete C.O.T.C. course, which is spread over three years, includes 90 hours of theoretical instruction and a maximum of 48 weeks practical training.

ARCTIC ACCOMMODATION.—Two prefabricated aluminium huts are to be tested by the Army in the far North next Winter. They have been designed for economical heating and to withstand winds up to 100 miles an hour, and gusts of 125 miles an hour.

WAR MEMORIALS.—Six stained glass windows depicting the landings of Canadian soldiers at Dieppe in 1942, and that of nuns of the Order of Augustinians in Canada more than 300 years ago, were unveiled recently in Hotel Dieu Hospital, Dieppe. A Commemorative Plaque in honour of the Canadian soldiers killed, or who later died of wounds, in the famous raid on Dieppe during the recent war is also to be erected in the Cathedral there.

Destined to lie in the Kitchener Memorial Chapel of St. Paul's Cathedral in London, a recently completed Book of Remembrance containing the names of Royal Canadian Engineers who gave their lives in the 1939–45 War is to be shown in Canada prior to shipment.

AUSTRALIA

HONOURS AND AWARDS.—The following were included in the King's Birthday Honours List published on 8th June, 1950:—

K.C.M.G.—Lieut.-General J. Northcott, C.B., M.V.O.

K.B.E.—Lieut.-General S. G. Savige, C.B., C.B.E., D.S.O., M.C., E.D.

Promotion.—General Sir Thomas A. Blamey, G.B.E., K.C.B., C.M.G., D.S.O., promotion to the rank of Field-Marshal in the Australian Military Forces.

APPOINTMENTS AND PROMOTIONS.—Brigadier R. N. L. Hopkins has been appointed Deputy Chief of the General Staff at Army Headquarters and has been promoted to Major-General.

Major-General J. A. Chapman, D.S.O., has been appointed G.O.C. Fourth Military District which was recently brought up to the full status of other military Commands of the Commonwealth.

Brigadier W. J. V. Windeyer, C.B.E., D.S.O., E.D., has been appointed G.O.C., 2nd Division, C.M.F., and as Citizen Forces Member of the Military Board, with the rank of Major-General.

Brigadier S. H. W. C. Porter, D.S.O., has been appointed G.O.C. 3rd Division, C.M.F., with the rank of temporary Major-General.

RECRUITING

RECRUITING DURING 1949.—During 1949, 1,628 were enlisted in the Regular Army and 8,377 in the Citizen Military Forces. The cost of army recruiting for that year was £32,138.

BRITISH RECRUITS.—Mr. Harold Holt—the Immigration Minister, announced on 22nd May that Britain had approved a scheme for Australia to recruit 4,500 single men in England for her Regular Army. Recruits would serve six years in Australia before discharge. Apart from a few specialists up to 41 years of age, they would be tradesmen between 18 and 30. The Australian Army representatives in London would select the men, who would be subject to the usual immigration requirements.

VARIATION OF EXISTING PROCEDURE.—A variation in existing procedure to provide for Corps recruiting has been given a trial during the period 1st March to 30th June, in conjunction with the normal recruiting procedure. It was considered that this system, under which recruits could nominate their Corps before enlistment would add incentive to young men choosing the Army as a career. During the trial period prospective recruits who had not applied for enlistment in the normal manner could be approached for enlistment with respective Corps of the Regular Army and, in the case of those not required to undergo basic training, unit identity was allotted immediately on enlistment. Where it was necessary for recruits to undergo basic training, unit allocation was made in accordance with routine procedure. Personnel recruited under this scheme were included in the normal percentage allocation of recruits to Corps.

PAKISTAN

PAKISTAN MILITARY ACADEMY.—Pakistan Military Academy, recently established, is situated at Kakul, a few miles from Abbottabad in the North-West Frontier Province. It is suitably equipped with professional and recreational facilities and, surrounded by views of the Himalayas, possesses an ideal climate.

On 4th February, when fifty-five cadets received their Regular Commissions, the Premier—M. Liaquat Ali Khan, presented the King's Colour to the Academy on a Ceremonial Parade.

EXERCISE "HORATIUS."—General Sir Douglas Gracey, C.-in-C. Pakistan Army, with Major-General N. A. M. Raza and Major-General Nazir Ahmed, attended Exercise "Horatius" at the Staff College, Camberley, in May. Subsequently, Major-General Raza and Major-General Nazir Ahmed carried out an extensive tour of training establishments in the United Kingdom and B.A.O.R., under arrangements made by the War Office.

Major-General Raza returned to Pakistan via Turkey where he visited training establishments of all three Services, under the guidance of the Turkish High Command.

CEYLON

A link between the Ceylon Government and the British Army which has lasted for more than 150 years was severed when Brigadier F. S. Reid, the last commander of British

troops in the island, left on 22nd June. Before he went on board the steamship Devonshire, Brigadier Reid inspected a guard of honour provided by the Ceylon Army. The Ceylon Army is taking over all peace-time functions hitherto performed by the British garrison. The remaining British troops are confined to a few stations like Trincomalee, the provision for which exists under the Visiting Forces Act.

GIBRALTAR

The 1st Battalion, The Royal Irish Fusiliers is to be relieved by the 78th H.A.A. Regiment, Royal Artillery, at the end of August. It is believed to be the first occasion in two and a half centuries (since the Rock was captured in 1704) that the garrison of Gibraltar has not contained at least one infantry battalion. The new gunner regiment will arrive in the "Empire Test" on August 26th, and there will be an overlap of four days before the Fusiliers leave for Northern Ireland in the "Empress of Australia." The Fusiliers arrived in Gibraltar last February from Akaba, after ten years service oversea. Their term on the Rock has been one of the shortest of any unit in peace-time.

MALTA

On 30th April The Princess Elizabeth, Duchess of Edinburgh, visited the British Military Hospital at Mtarfa. After a tour lasting an hour, during which she visited the families' wing, the general ward, and the main block, Her Royal Highness drove to the Q.A.R.A.N.C. mess, where Q.A.R.A.N.C. and S.S.A.F.A. sisters were presented to her.

INDIA

It was announced in New Delhi on 22nd March that Major-General S. P. Thorat, Commander of the East Punjab Area, had been appointed Chief of the General Staff of the Indian Army in succession to Major-General Kalwant Singh.

FOREIGN

CZECHOSLOVAKIA

It was reported from Vienna on 16th June that an Order of the Day promulgated by Dr. Cepicka, the new Czechoslovak Minister of Defence, gives "political officers" greater responsibility and instructs them to "strengthen the authority" of the military officers. The order refers to the need to improve the fighting spirit of the army and tighten discipline through the extension of political teaching. The activity of the Communist Party in the army is to be intensified. The elevation of the army education officers to the virtual rank of political commissars follows a "purge" of the Czechoslovak High Command as it existed under Dr. Cepicka's predecessor, General Svoboda.

FRANCE

A French Army exercise was held during the night of 1st/2nd July near Mantes, west of Paris, and was watched by 300 regulars and 500 reserve officers. About 3,000 men belonging to armoured, engineer, and parachute units staged a crossing of the Seine. Parachute troops captured a bridgehead at La Roche—Guyon, and the engineers threw a bridge across the river for the armour, which then attacked in the direction of Ambleville. The object of the exercise was to demonstrate the crossing of a major obstacle and to study the reactions of enemy armour.

GERMANY

More than 10,000 British, Norwegian, and Danish troops took part in an exercise on the Lüneburg heath in North Germany, which started on 25th July. The forces defending "Redland" included a British tank regiment and Norwegian troops, and the attacking "Blueland" forces had a British armoured brigade and Danish troops. Blueland attacked from the south in the general direction of Hamburg, and troops were moved up throughout the night to attempt a river crossing at first light on the following day.

INDONESIA

A joint communiqué issued by the Indonesian and Dutch authorities in Jakarta on 9th May announced that the Royal Netherlands Indies Army, founded 130 years ago, would cease to exist on 26th July. It was stated that 15,000 members of this Army had already been transferred to the Indonesian Armed Forces, that 20,000 Dutch and Eurasian troops were being transferred to the Netherlands, and that the remaining 25,000 men would be either demobilized or transferred to the Indonesian Forces by 26th July.

ITALY

Signor Pacciardi, Minister of Defence, reviewing in the Senate on 14th June the state of Italy's armed forces, declared that the Army would soon have 12 divisions, the strength allowed it by the peace treaty.

Nine divisions existed to-day, in addition to the Alpine troops and an armoured brigade, and a tenth division was being formed. To these forces would be added the troops now in Somaliland, as the aim was to replace those by native battalions.

RUSSIA

It was announced on 7th June that Major-General Kotikov, the Soviet commandant of Berlin, was being recalled to Russia to undertake new duties, and that Mr. S. A. Dengin, a civilian, would succeed him there. His post was recently described by the Russians as that of representative in Berlin of the Soviet Control Commission. The three Generals who represent the Soviet Control Commission in Brandenburg, Saxony and Thuringia are also returning to Russia, and will similarly be succeeded by civilians. These posts are the equivalent of the *Land* commissioners in western Germany. The staff of the Soviet Control Commission in Germany is to be reduced at the beginning of August or September.

UNITED STATES

Major-General Lewis A. Pick, Chief of Engineers, United States Army, arrived at London Airport on 9th July, 1950, on an official visit to Royal Engineer formations and units in the United Kingdom, at the personal invitation of Field Marshal Sir William J. Slim, Chief of Imperial General Staff.

The visit is a reciprocal one, in that last year the Engineer-in-Chief, War Office (Major-General A. D. Campbell), visited the U.S.A. at the invitation of the United States Army.

AIR NOTES

GREAT BRITAIN

H.M. The King

His Majesty graciously presented the Esher Efficiency Challenge Trophy to No. 604 (County of Middlesex) Squadron, R.Aux.A.F., at Buckingham Palace, on 21st June.

Their Majesties the King and Queen, accompanied by Princess Margaret and other Members of the Royal Family, were present at the R.A.F. Display at Farnborough, on 7th July.

On 27th July, Her Majesty the Queen unveiled a memorial in the Priory Church of St. Bartholomey the Great, to members of the No. 600 (City of London) Squadron, R.Aux.A.F., who have laid down their lives in the past twenty-five years.

Appointments

Air Ministry.—Group Captain G. I. L. Saye, C.B., O.B.E., A.F.C., to be Director of Manning with the acting rank of Air Commodore, vice Air Commodore N. A. P. Pritchett (May, 1950).

Air Commodore G. S. Shaw to be Director of Personal Services vice Air Commodore C. E. Chilton (1st September, 1950).

United Kingdom.—Air Commodore W. J. Crisham, C.B.E., to be Commandant of the R.A.F. Central Fighter Establishment vice Air Commodore D. F. W. Atcherley, C.B.E., D.S.O., D.F.C. (April, 1950).

Air Commodore N. A. P. Pritchett to be Air Officer Commanding No. 67 (Northern Ireland) Reserve Group and Senior Air Force Officer in Northern Ireland (1st May, 1950).

Air Vice-Marshal A. C. Stevens, C.B., to be Senior Air Staff Officer, Coastal Command, vice Air Vice-Marshal S. N. Webster, C.B.E., A.F.C. (30th June, 1950).

Air Commodore T. B. Prickman, C.B.E., to be Air Officer in charge of Administration at Headquarters, R.A.F. Reserve Command, vice Air Commodore R. H. S. Spaight, C.B.E. (June, 1950).

Air Commodore H. H. Chapman, to be Air Officer Commanding No. 43 Group, Maintenance Command, vice Air Vice-Marshal H. G. White, C.B.E. (1st July, 1950).

Air Commodore B. V. Reynolds, C.B.E., to be Air Officer Commanding No. 22 Group, Technical Training Command, with the acting rank of Air Vice-Marshal, vice Air Vice-Marshal P. E. Maitland, C.B., M.V.O., A.F.C. (15th July, 1950).

Air Commodore H. E. Nowell, C.B., C.B.E., to be Assistant Commandant of the R.A.F. Staff College, Bracknell, vice Air Commodore L. F. Sinclair, G.C., C.B., C.B.E., D.S.O. (16th July, 1950).

Air Commodore L. F. Sinclair, G.C., C.B., C.B.E., D.S.O., to be Air Officer Commanding R.A.F. College, Cranwell, vice Air Commodore G. R. Beamish, C.B., C.B.E. (31st July, 1950).

Air Commodore R. N. Waite, C.B., C.B.E., to be Air Officer in Charge of Administration at Headquarters, Transport Command, vice Air Vice-Marshal P. H. Mackworth, C.B., C.B.E., D.F.C. (6th August, 1950).

Air Vice-Marshal E. C. Hudleston, C.B., C.B.E., to be Air Officer Commanding No. 1 Group, Bomber Command, vice Air Vice-Marshal G. C. Mills, C.B., D.F.C. (8th August, 1950).

Western Union.—Air Vice-Marshal G. H. Mills, C.B., D.F.C., to be Head of the United Kingdom Military Delegation to the Western Union Military Staff Committee, vice Air Vice-Marshal E. C. Hudleston, C.B., C.B.E. (8th August, 1950).

WASHINGTON.—Air Commodore F. R. D. Swain, C.B.E., A.F.C., has joined the British Joint Services Mission, Washington, as Senior Air Staff Officer, vice Air Commodore H. E. Nowell, C.B., O.B.E. (June, 1950).

IRAQ.—Air Commodore G. R. Beamish, C.B., C.B.E., to be Air Officer Commanding Air Headquarters, Iraq, with the acting rank of Air Vice-Marshal, vice Air Vice-Marshal J. N. Boothman, C.B., D.F.C., A.F.C. (1st September, 1950).

FAR EAST.—Air Vice-Marshal C. A. Bouchier, C.B.E., D.F.C., has been appointed Senior British Military Liaison Officer to General MacArthur.

SOUTH AFRICA.—Group Captain P. D. Cracroft, A.F.C., to be Senior Air Liaison Officer, United Kingdom Liaison Staff, South Africa, with the acting rank of Air Commodore, vice Air Commodore G. S. Shaw.

PROMOTIONS

The Air Ministry have announced the following promotions :—

Air Commodore C. P. Brown, C.B., C.B.E., D.F.C., granted the acting rank of Air Vice-Marshal (7th April, 1950).

Air Marshal Sir W. Alec Coryton, K.C.B., K.B.E., M.V.O., D.F.C., promoted Air Chief Marshal (15th May, 1950).

Air Marshal Sir Leslie N. Hollinghurst, K.C.B., K.B.E., D.F.C., promoted Air Chief Marshal (15th May, 1950).

Air Marshal Sir Hugh W. L. Saunders, K.C.B., K.B.E., M.C., D.F.C., M.M., promoted Air Chief Marshal (15th May, 1950).

Air Chief Marshal Sir John C. Slessor, G.C.B., D.S.O., M.C., Chief of the Air Staff, promoted to the rank of Marshal of the Royal Air Force (8th June, 1950).

The under-mentioned half-yearly promotions were announced on 30th June, 1950 :—

Air Vice-Marshal to Air Marshal—

C. R. Steele, C.B., D.F.C. (Acting Air Marshal).
R. M. Foster, K.C.B., C.B.E., D.F.C. (Acting Air Marshal).
F. J. Fogarty, K.B.E., C.B.E., D.F.C., A.F.C. (Acting Air Marshal).

Air Commodore to Air Vice-Marshal—

G. R. Beamish, C.B., C.B.E.
N. H. D'Aeth, C.B.E. (Acting Air Vice-Marshal).
W. E. Staton, C.B., D.S.O., M.C., D.F.C. (Acting Air Vice-Marshal).
B. V. Reynolds, C.B.E.
D. F. W. Atcherley, C.B., C.B.E., D.S.O., D.F.C. (Acting Air Vice-Marshal).
T. G. Pike, C.B., C.B.E., D.F.C. (Acting Air Vice-Marshal).

Group Captain to Air Commodore—

G. P. Chamberlain, C.B., O.B.E. (Acting Air Commodore).
H. J. G. E. Proud, C.B.E. (Acting Air Commodore).
W. G. Cheshire, C.B.E. (Acting Air Commodore).
J. G. Elton, C.B.E., D.F.C., A.F.C. (Acting Air Commodore).
C. E. Chilton, C.B.E. (Acting Air Commodore).
G. I. L. Saye, C.B., O.B.E., A.F.C. (Acting Air Commodore).

TECHNICAL BRANCH

Group Captain to Air Commodore—

J. Marson, C.B.E. (Acting Air Commodore).
L. R. S. Freestone, O.B.E., A.F.R.Ae.S. (Acting Air Commodore).

ROYAL AIR FORCE REGIMENT

Group Captain to Air Commodore—

E. W. Towsey, O.B.E. (Acting Air Commodore).

MEDICAL BRANCH

Air Commodore to Air Vice-Marshal—

W. E. Barnes, M.R.C.S., L.R.C.P., D.T.M. & H. (Acting Air Vice-Marshal).

Group Captain to Air Commodore—

R. H. Stanbridge, O.B.E., M.R.C.S., L.R.C.P., D.P.M. (Acting Air Commodore).

RETIREMENTS

Air Vice-Marshal Sir Anthony L. Paxton, K.B.E., C.B., D.F.C., has been placed on the Retired List (30th June, 1950).

The Rev. Archibald McHardy, C.B., C.B.E., D.D., Principal Church of Scotland Chaplain since 1928, has been placed on the Retired List.

THE KING'S BIRTHDAY HONOURS

The following awards were included in the King's Birthday Honours List published on 8th June, 1950 :—

K.C.B.—Air Marshal T. M. Williams, C.B., O.B.E., M.C., D.F.C., Acting Air Marshal R. M. Foster, C.B., C.B.E., D.F.C.

C.B.—Air Vice-Marshal A. P. Ledger, C.B.E., Air Vice-Marshal W. J. Seward, C.B.E., Acting Air Vice-Marshal D. F. W. Atcherley, C.B.E., D.S.O., D.F.C., Acting Air Vice-Marshal R. L. R. Atcherley, C.B.E., A.F.C., Air Commodore A. P. Revington, C.B.E., Group Captain D. W. F. Bonham-Carter, D.F.C., Principal Chaplain The Reverend A. McHardy, C.B.E., M.C., M.A., D.D., K.H.C.

G.B.E.—Air Chief Marshal The Hon. Sir Ralph A. Cochrane, K.C.B., K.B.E., A.F.C., A.D.C.

K.B.E.—Air Marshal P. C. Livingston, C.B., C.B.E., A.F.C., F.R.C.S., F.R.C.S. (Edin.), L.R.C.P., D.P.H., D.O.M.S., K.H.S., Acting Air Marshal, F. J. Fogarty, C.B., D.F.C., A.F.C.

O.B.E.—Air Commodore A. Briscoe, M.B., B.Ch., K.H.P., Air Commodore L. de V. Chisman, D.F.C., Air Commodore G. Scarrott.

GEORGE MEDAL

The King has been graciously pleased to approve the award of the George Medal to Leading Aircraftman P. F. Anderson, R.A.F., in recognition of the courage and initiative displayed in rescuing two airmen from a blazing flying boat at the R.A.F. Station, Calshot, on 23rd February, 1950.

WASHINGTON CONFERENCE.—Air Chief Marshal Sir Ralph Cochrane—Vice-Chief of the Air Staff, Air Vice-Marshal C. B. R. Pelly—Assistant Chief of the Air Staff, Operational Requirements and Dr. R. Cockburn—Chief Scientific Adviser to the Air Ministry, flew to Washington on 14th June, to discuss requirements for the co-ordination of air defence under the Atlantic Treaty. The British Combined Services Committee at Washington is under the leadership of Marshal of the Royal Air Force Lord Tedder.

ORGANIZATION

HOME COMMAND.—In future the Reserve Command will be known as Home Command.

Recently a number of administrative responsibilities have been transferred to Reserve Command in order to effect economy and provide a more efficient and regional

system of control, to allow operational Commands to concentrate more on their primary functions, to provide a better Royal Air Force representation throughout the Country, and to facilitate more decentralization of detailed control from the Air Ministry. These new responsibilities include the control of the Recruiting Centres, administrative control of the R.A.F. Record Office and the control of a variety of Units previously administered by Technical Training Command. The control of Medical Units will shortly take place.

The Command is organized on a regional basis and is divided into seven Groups corresponding to the Army Commands with which it is in co-ordination on all matters concerning regional defence.

The Air Officer Commanding-in-Chief is Air Marshal Sir Robert Foster, K.C.B., C.B.E., D.F.C.

" ALL WEATHER " AIR FORCE.—In addition to their flying badge, all qualified R.A.F. pilots must now obtain an Instrument Rating showing current proficiency and past experience in " weather " or Instrument Flight conditions.

All student pilots now have to obtain a White Instrument Rating Card before they can obtain their " wings." For a Green Card pilots must show a record of at least 500 flying hours and for a Master Green Card, 2,000 flying hours of which 10 per cent. must have been as first pilot while handling the controls under actual Instrument Flight conditions.

This Instrument Rating Scheme is to provide a standard indication of the weather in which it is normally advisable to permit any pilot to fly. No weather limitations apply to pilots possessing a Master Green Rating Card.

In the near future, the possession of a valid Instrument Card will be a requirement for all flying posts of responsibility in the Royal Air Force.

Where possible, flight through thunderstorms is in future to be part of the training of all pilots. Research by R.A.F. and U.S.A.F. pilots is showing that if correct techniques are used, flight through thunderstorms is not unduly hazardous. As a thunderstorm is mainly characterized by vertical air currents, the technique is to concentrate on maintaining a level flight altitude regardless of height.

PERSONNEL

NATIONAL SERVICE MEN.—An Air Ministry Order sets out the procedure for the transition of National Service men from whole to part-time service. The first men who entered the Service after 1st January, 1949, and are liable for eighteen months full-time service followed by four years part-time service on the Reserve have completed their full-time service in July.

On leaving the Royal Air Force, training pilots will continue flying training as members of the R.Aux.A.F. Squadrons, or Reserve Flying Schools. Many pilots will be granted Commissions in the R.Aux.A.F. and the R.A.F.V.R.

National Service men in ground trades will be invited to volunteer for the R.Aux.A.F. or the R.A.F.V.R. as an alternative to four years part-time service in the special " H " section of the R.A.F. Reserve, where they will be liable for training up to a maximum of 60 days in that time.

Another choice for National Service men on reserve service will be to take part in the training of A.T.C. cadets. Spare time service as a Commissioned or Warrant Officer will be accepted in lieu of Class " H " Reserve obligations.

AIR CREW RANKS.—The new scheme for aircrew introduced soon after the War, which involved a change in rank titles whereby a Sergeant Pilot became Pilot II, has not worked out as had been hoped, and it has been decided to introduce a new scheme which will include the reversion to the traditional rank titles of Sergeant and Flight Sergeant.

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Under the new proposals, Sergeant rank will be granted to every member of aircrew when he receives his wings, and the titles will be coupled with the appropriate aircrew designation. For the top rank, it is intended to retain the present title of Master Pilot or Master Signaller, etc.

The scheme will provide a definite improvement in long service career prospects, and it is hoped that any aircrew contemplating leaving the Service will wait until further details are published.

Aircrew retained for flying duties after their initial eight years service will now be able to sign on for a 22-year engagement, at the end of which time opportunities will be provided for those wishing to serve until the age of 55.

TRADE UNION RECOGNITION.—The Society of Goldsmiths, Jewellers and Kindred Trades, and the Union of Shop, Distributive and Allied Workers have both agreed to recognize R.A.F. dental mechanics as being eligible for membership.

MEMORIALS.—On 1st June, a Cross of Remembrance erected in Scopwick Churchyard, Lincolnshire, by the Imperial War Graves Commission in memory of aircrew, the majority of whom belonged to the Royal Canadian Air Force, who are buried there was dedicated by the Bishop of Lincoln.

BATTLE OF BRITAIN COMMEMORATION SERVICE.—A Thanksgiving Service commemorating the tenth anniversary of the Battle of Britain will be held in Westminster Abbey on 17th September, at 3.0 p.m.

REHABILITATION CENTRE.—On 3rd July, Her Royal Highness the Duchess of Kent opened a new R.A.F. Rehabilitation Centre at Headley Court, near Leatherhead.

MATERIAL

METEOR N.F. Mk. 11.—Information regarding the new R.A.F. jet-propelled night fighter was published on 12th June. Produced by the Armstrong-Whitworth Aircraft Co. from original basic designs by the Gloster Aircraft Co., it appears to be a combination of the Meteor VIII jet day-fighter and the Meteor VII two-seater trainer.

SPEED RECORD.—On 12th May, a Gloster Meteor jet fighter, piloted by Squadron Leader J. Cooksey, won the 1,000 kilometre closed circuit international speed record. He flew a total distance of 625 miles in 1 hour 12 minutes and 58 seconds at an average speed of 510.92 m.p.h., most of the flight being made at 30,000 feet. The previous World speed record was set up in June, 1946, by Lieutenant H. A. Johnson, U.S.A.F., flying a Lockheed P.80 jet fighter.

B.29—WASHINGTON.—Following the usual practice in the Royal Air Force of giving names to aircraft instead of calling them by their type numbers, the B.29 aircraft recently received from America are to be known as "Washingtons."

GAS TURBINE SCHOOL.—The School of Gas Turbine Technology will reopen in October at Farnborough Place, Farnborough, Hampshire. The School was founded in 1944 to give jet-engine instruction to Dominion Air Force personnel and it now runs courses covering the use of gas-turbines in aircraft, locomotives, road vehicles, ships, power stations, process power and other industrial applications. The School had grown too big for its premises at Lutterworth.

BOMBING RANGE IN CYPRUS.—Bomber and Fighter squadrons in the Middle East have been provided with an island bombing range in Cyprus. It permits heavy bombers with practice bombs to bomb from heights up to 20,000 feet by day or night. Vampire and other fighter-bomber squadrons are also able to do day and night bombing.

NEW COMPASS.—The latest British fighter aircraft are fitted with a new miniature magnetic compass developed by the Admiralty Compass Observatory. It is known as the Type E.2 and is for emergency use in the event of failure of the remote indicating compass. It weighs only 3¼ oz., and could be enclosed within one 2-in. cube. A vertical compass card is luminized for use at night. The compass is intended to be fitted near the windscreen so that the pilot need not look down into the cockpit to read it.

Women's Royal Air Force

The Air Ministry announced the following appointments on 21st May :—

Group Officer Lady Seton, O.B.E., to be Deputy Director, W.R.A.F.

Wing Officer A. M. Muir to be W.R.A.F. Staff Officer, B.A.F.O., Germany, with the acting rank of Group Officer.

Wing Officer L. H. Turner, O.B.E., to be Inspector of W.R.A.F., with the acting rank of Group Officer.

School of Domestic Science.—A W.R.A.F. School of Domestic Subjects has recently been established at the R.A.F. Station, Wyton. The work of the School will be a continuation of the courses in domestic subjects which have been organized at the R.A.F. Station, Wyton. Courses are of twelve days duration.

Reserve Forces

Summer Camps.—Several R.Aux.A.F. Squadrons will spend their fortnight's annual camp in Germany at Sylt—an island off the West coast of Schleswig-Holstein. About 3,700 members of Fighter Control Units will attend this year.

Members of the Light A.A. Squadrons of the R.Aux.A.F. Regiment will have their annual Summer camp at the R.A.F. Station, Watchet, Somerset.

Esher Trophy.—After a lapse of ten years, the Esher Trophy was revived in 1949. It was founded 24 years ago by the late Viscount Esher, and is awarded annually to the auxiliary flying squadron considered to be of the highest operational war standard. It has been awarded this year to No. 604 (County of Middlesex) Squadron, who won it in 1932, 1936 and 1937.

Scholarships in the A.T.C.—Winners of scholarships in the Air Training Corps and the R.A.F. Section of the Combined Cadet Force are to receive free flying instruction. The Air League will provide funds for further flying scholarships in addition to the two hundred provided by the Air Ministry. Training will be up to the standard set for a private pilot's licence, which requires a minimum of thirty hours flying instruction.

International Exchange Plan.—Fifty cadets have been chosen to go for a two-weeks' sight-seeing tour—25 to the U.S.A. and 25 to Canada, in August. A similar number have been selected from Canada and the United States to tour England.

Special Flights and Exercises

Arctic Flights.—A Lincoln aircraft embarked from the newly-established R.A.F. College at Manby, Lincolnshire, on 16th June, for the first of a series of high altitude exercises over the Arctic Circle. The Lincoln flew to Godhaven, in Greenland, and from there took off on a non-stop flight of about 2,000 miles, mostly over the Arctic Ocean.

A second Lincoln, piloted by Wing Commander E. Russell-Bell, made a navigational flight over the North Pole in July. This was the first R.A.F. flight over the North Pole since May, 1945, and was one of a series of flights being carried out as part of the flying training at Manby.

Royal Air Force Display, Farnborough.—This Display, held on 7th and 8th July, was the first full-scale demonstration staged since 1937 at Hendon. The Display included two set pieces, the reconstruction of the R.A.F. raid on Amiens Prison, and an attack on a strong point. Flying included individual and formation aerobatics by Meteor and Vampire jet fighters, large formation fly-pasts, " crazy " and precision formation flying, a helicopter circus, demonstrations by the new Venom jet fighter-bomber and the Canberra twin-jet bomber. Veteran aircraft were also demonstrated. A Hall of Achievement, recalling some of the outstanding peace-time flights of the R.A.F. by means of photographs and models, was housed in hangars.

Six Commonwealth Countries, the United States of America, France, the Netherlands and Belgium were represented in the massed fly-past at the end of the proceedings.

ROYAL AIR FORCE DISPLAY, GUTERSLOH.—The British Air Force of Occupation in Germany held their second annual display at Gutersloh on 21st June. The display was opened by an inspection of the Guard of Honour by Air Chief Marshal Sir James Robb, Commander-in-Chief Air Forces, Western Europe.

WESTERN UNION AIR DEFENCE EXERCISE.—A large-scale combined air exercise, commanded by Air Chief Marshal Sir James Robb, Commander-in-Chief Air Forces, Western Union, and to be known by the code name "Cupola," is being planned to take place in August.

DOMINIONS

CANADA

R.C.A.F. COLOURS.—His Majesty the King has approved a King's Colour and an R.C.A.F. Colour for the Royal Canadian Air Force. These were presented by His Excellency the Governor-General on 5th June, at a full ceremonial Trooping the Colour, performed by the R.C.A.F. for the first time.

The Colours will be retained at Air Force Headquarters, and duplicate sets will be presented to Training Command Headquarters, Trenton, and to N.W. Air Command Headquarters, Edmonton.

Ultimately, the Royal Canadian Air Force Colour will bear those battle honours to which the Air Force is entitled. The question of appropriate battle honours is under consideration.

OPERATION "WHIPSTOCK."—Squadrons of the Royal Canadian Air Force took part with units of the United States Air Force in an air defence manœuvre, known as Operation "Whipstock" in Southern British Columbia.

AUSTRALIA

The following were among the honours conferred on the Observance of the King's Birthday :—

C.B.—Air Vice-Marshal F. M. Bladin, C.B.E., R.A.A.F.

C.B.E.—Air Commodore F. R. W. Scherger, D.S.O., A.F.C., R.A.A.F.

MALAYA.—At the request of the United Kingdom Government, Australia is providing transport planes and air crews to assist in the operations in Malaya.

ACCOMMODATION.—A temporary solution of the housing shortage for married R.A.A.F. personnel has been found in the purchase of a number of prefabricated houses. Under a policy of maintaining married men on service in their home States for as long a period as possible, less than 5 per cent. of married R.A.A.F. personnel are serving far from their homes.

MALAYA

A Malay Auxiliary Air Force will shortly be formed in Singapore. Volunteers will train in the evenings and at weekends, and for a fortnight in camp. They will be called on for full-time service in an emergency. Pilot training will be undertaken at Tengah airfield, initially with Tiger Moth aircraft.

SOUTH AFRICA

MEMORIAL.—A memorial in the form of a cenotaph with two gates, was unveiled at Waterkloot air station, near Pretoria, on 31st May. This date will in future be observed as a Day of Remembrance. The Roll of Honour is in three chapters, and it is hoped to add a fourth chapter, giving the names of members of the Royal Air Force who lost their lives while serving in South Africa, or with South African squadrons in a theatre of war.

FOREIGN

DENMARK

One important result of the recent Defence Bill is the establishment of an Air Force in addition to the Army and the Navy. Chief of the Air Force will be Lieut.-General C. C. J. Forslev—one time Chief of the Army Air Service, and recently Military and Air Attaché in Washington.

All officers and men in the previous Army Air Service will be transferred to the new Air Force.

The intended size of the new Danish Air Force is not known, but the main force will consist of Gloster Meteor fighters.

AIR BASES IN GREENLAND.—The Danish Foreign Minister has stated that his Government is considering the question of taking over the former U.S.A.F. base " Bluie West 8 " (near Hosteinborg on the West coast of Greenland), which the Americans have now evacuated. Although the Danish Government is desirous of maintaining the base, recent heavy expenditure in Greenland will probably delay any decision.

FRANCE

FIVE-YEAR AIRCRAFT PRODUCTION PLAN.—On 21st April, the French Cabinet approved a five-year aircraft production plan, allowing for a total expenditure of 136 milliards of francs, as well as supplementary credits of over 4 milliards of francs for the purchase of naval aircraft abroad. The programme provides for 750 fighter, 80 transport, 295 light twin-engine, 265 training and 112 artillery observation aircraft. In the naval category provision is made for 15 anti-submarine, 25 heavy amphibious, 150 chasseurs and 45 naval attack aircraft.

NATIONAL AIR DAY.—Squadrons of R.A.F., U.S.A.F. and Belgian aircraft participated in the French National Air Day celebrations at Orly airfield on Sunday, 11th June.

NETHERLANDS

Under a scheme drafted by the Dutch Ministry of War, about 7,900 men of the Royal Netherlands Indies Army and Army Air Force will be eligible for transfer from Indonesia to the corresponding Service in Holland. They are not expected to be repatriated before January, 1951.

RUSSIA

MAY DAY REVIEW.—A United States account of the annual May Day military celebrations over Red Square stated that the air parade was commanded by Lieut.-General Vassily Stalin—son of the Premier. He led the parade in a four-engined bomber escorted by four single jets of the latest type.

The air display included the largest group of four-engined bombers to fly across Red Square, consisting of three flights of 21 each. In addition, 24 new twin-engined jet aircraft and three flights of 45 single jet fighters took part. The display was nearly twice as large as the demonstration last Autumn during the November Revolution celebrations.

REVIEWS OF BOOKS

GENERAL

History of United States Naval Operations in World War II, Vol. V : The Struggle for Guadalcanal, August, 1942—February, 1943. By Samuel Eliot Morison. (Geoffrey Cumberledge, Oxford University Press.) 42s.

During the six months covered by this volume, the United States Navy fought six major actions in waters adjacent to Guadalcanal, " more bitter and bloody than any naval engagements in American history since 1814." Four were night gunfire actions of a kind that may never be fought again ; the others carrier-air battles of the pattern set at Coral Sea ; and all highly interesting and significant in the history of war. There were also a score of minor naval actions. Thus the Guadalcanal campaign is unique for the variety and multiplicity of the weapons employed and for co-ordination between naval, military and air power. " No campaign in modern history," writes the author, " is more fraught with ferocity and misery ; none has blazed more brightly with heroism and self-sacrifice."

The book opens with a description of the King Solomon Isles, among them Guadalcanal," that mountainous island " on which the U.S. Marines landed on 8th August, 1942, and which " was bitterly contested by the forces of the United States and Japan for almost six months." In April, 1942, the Pacific had been divided into two great Allied Commands —the South-West Pacific Area under General Douglas MacArthur, and the Pacific Area under Admiral Chester Nimitz. A subordinate part of Admiral Nimitz's area was the South Pacific Area under Vice-Admiral Robert Ghormley, and it was to Admiral Ghormley that the seizure of Tulagi and Guadalcanal was entrusted. Detailed to escort the Vice-Admiral's amphibious force were eight cruisers (three of them Australian) and a destroyer screen under Rear-Admiral V. C. Crutchley, V.C., of the Royal Navy, most of them destined to take a terrible beating in the First Battle of Savo Island on 9th August.

In Chapter II, Captain Morison takes up the story where he left it off in his previous volume (reviewed in the May, 1950, JOURNAL), with the First Battle of Savo Island, the small island which lies between Guadalcanal and Florida Island. The battle opened during the night of 8th-9th August and, though the Allied force suffered the grievous loss of one Australian and three U.S. cruisers, we did, in the words of Admiral Crutchley " achieve our object, which was to prevent the enemy from reaching the transports." Though this defeat was not decisive, it might well have been had the Japanese followed it up with greater energy and concentration of force.

In Chapter III the author describes the three vital weeks on Guadalcanal following the withdrawal of the defeated U.S. naval forces on 9th August during which, in the face of determined Japanese efforts to dislodge them, the U.S. Marines hung grimly on to their precarious foothold. Had Guadalcanal with its newly constructed Henderson airfield been lost, the first U.S. Pacific offensive would have ended in a costly failure. All was well, however, for the Americans won the day.

Then follows, in Chapter IV, a graphic account of the Battle of the Eastern Solomons fought, on 24th August, 1942, as the result of the intercepting of a Japanese attempt to land 1,500 troops on Guadalcanal, in the hope of ousting the 17,000 U.S. Marine troops holding Henderson airfield. Like the First Battle of Savo Island this battle—the third of the great carrier battles of the War, was not decisive. In the author's words " A major portion of the Imperial Fleet had gathered from far and near to safeguard the transportation of 1,500 ground troops to Guadalcanal. This fleet . . . had failed to protect its troop transports or even to inflict damage on the numerically inferior American forces comparable to what it sustained." Thus the Japanese plan to capture Guadalcanal was brought to nought owing to the appearance of an American striking force.

After the battle there followed a period of attrition tactics, indecisive and unsatisfactory to both sides. The U.S. Navy still smarted from the sting of Savo Island and among the Japanese there was an even stronger feeling of " on to victory."

On the night of 11th-12th October, at the very depth of this Winter of discontent, came the Battle of Cape Esperance, at one time known as the Second Battle of Savo, which gave the tired Americans a heartening victory and the proud Japanese a resounding defeat. This victory was not, however, as the author points out in Chapter VIII, entirely an unmixed blessing since it led the Americans into some fallacious conclusions which had unfortunate results in subsequent engagements. Though Cape Esperance was a tactical American victory the decisive naval battle of the Solomons had yet to be fought.

There follows an account of the Battle of Henderson Airfield, which ended shortly after daylight on 26th October with the sinking of the Japanese bombardment force flagship. As the sounds of the battle faded the two navies were hurling aircraft at each other's ships in the great Battle of Santa Cruz Island—the fourth carrier-air battle to be fought in six months. Measured in combat tonnage sunk, the battle was a Japanese tactical victory and left the enemy more determined than ever to retrieve the island of Guadalcanal, but to the Americans the general situation at Guadalcanal was by no means unfavourable. The battle had gained priceless time—days in which the U.S. forces could reinforce and repair.

In Chapter XII Captain Morison devotes over sixty pages to the decisive Battle of Guadalcanal. During the battle the United States sustained the greater losses in ships but the elimination of two Japanese battleships and eleven Japanese transports was far more serious. Thus the conclusion of this battle was marked by a definite passing of the Americans to the offensive. Across the World, North Africa had been invaded and the Allies had reached, in the words of Mr. Churchill, " the end of the beginning." In the Pacific, from the Battle of Guadalcanal to 15th August, 1945, the way was rough, tough, and unchartered, but it led to Tokyo.

The bitter fighting for Guadalcanal went on till 9th February, 1943. That day, General Patch radioed to Admiral Halsey, " Total and complete defeat of Japanese forces on Guadalcanal effected 1625 to-day. . . . Am happy to report this kind of compliance with your orders." Thus ended one of the most bitterly fought out campaigns in contemporary American history.

" Sometimes," writes Captain Morison, " I dream of a great battle monument on Guadalcanal. . . . At other times I feel that the jagged cone of Savo Island, for ever brooding over the blood-thickened waters of the Sound, is the best monument to the men and ships who here rolled back the enemy tide."

The Struggle for Guadalcanal is well indexed and illustrated. Among many interesting photographs it includes a striking close-up view of a Japanese bomb actually bursting a few feet below, on the flight deck of the U.S.S. " Enterprise." In his new book Captain Morison has well maintained the standard of his earlier volumes. Like them, his new work is well worthy of a wide circulation.

Broken Thread. By Major F. S. G. Piggott, C.B., D.S.O. (Gale & Polden, Aldershot.) 21s.

In his foreword to this autobiography, Lord Hankey alludes to the author as having been " for more than a quarter of a century a pillar of those happy relations between our Country and Japan the severance of which was one of the many tragedies of World War II." It is the historical record of those relations before and after the termination of the Anglo-Japanese Alliance in 1921, as seen by an officer who has known Japan since the age of five and spent thirteen years in that Country on four separate tours of duty, which is the central theme of this book. It sheds new light on the circumstances which led to the loyal ally of the 1914-18 War becoming a treacherous and fanatical enemy in the 1939-45 War.

It was to appease American susceptibilities—both strategical and racial—that we agreed to end that Alliance, with the result that Japan, bitterly hurt and resentful, turned increasingly toward Germany and, when she thought the moment opportune, sought to get her own back on what she regarded as the chief author of the insult, as she regarded it, the United States, and the faithless friend—Britain.

That, very briefly, is the outline of the picture which General Piggott paints for us; but he fills in the details carefully, and with first hand knowledge. His enduring sympathy with Japan and liking for her people is apparent, and may colour his presentation of the case; but it invites conjecture as to how different things might have been in the late war and even in the Far East to-day, had Japan continued to grow up among the freedom-loving nations and taken her place as their partner instead of their prisoner. That she did not do so was doubtless due to the fault of politicians on both sides.

Some readers may find the frequent intrusion of social, personal and even domestic incidents into the narrative of the greater events dealt with by the author rather irksome, and may wish he had confined himself to the latter in a more concise treatment. Possibly he will yet consider doing so.

There are some interesting photographs and carefully compiled indexes.

Atlas International Larousse. (Librarie Larousse, Paris; distributed in Britain by George C. Harrap and Co., London.) £7 7s.

This sumptuous publication is something new among the greater atlases, for it presents the World in a bolder and more coherent way than does the page to a Continent or a Country system to which we have become accustomed.

It begins with three Physical maps—The North Polar Hemisphere; the Ancient Continent (30°W. to 150°E.); and the New Continent (150°E. to 30°W.). The remainder is divided into two parts—twenty-six maps specifically Political, and twenty-nine solely Economic.

The Physical maps provide altitude and sub-marine contours and valuable information about the more important continental waterways, i.e. those that are permanently navigable and those where navigation is intermittent due to drought or frost.

The Political maps present the regimes of the various Countries in striking colours and are sufficiently up-to-date to include such features as the U.S.A. leased bases and the strategical lay-out of Communist dominated territory. This part also carries particulars of sea trading so as not to overburden the Economic section.

The Economic maps are evidently intended to be the most important feature of the Atlas. They provide information on Sea, Land and Air Communications, Agriculture, Mines, Sources of Power and distribution of Industries. The limitations of this section are emphasized: the accuracy of the economic activities of the U.S.S.R. in particular, cannot be guaranteed: the maps were compiled between 1945 and 1949; and the territorial and industrial details of Germany are still uncertain.

A concise but useful text in French, English and Spanish, amplifies the information given by the maps. While Mercator's projection is retained where most convenient, many of the maps are on a global projection. The North Polar Hemisphere is repeated in numerous contexts, thereby emphasizing real distances especially as related to air communications.

Nomenclature, wherever possible, is in the three languages and in conformity with the vocabulary of the Universal Postal Union.

The Institution is greatly indebted to the British distributors and the French publishers for this handsome and valuable addition to the Reference Library.

Defence of the West. By B. H. Liddell Hart. (Cassell and Co.) 12s. 6d.

The wrapper of this publication bears a quotation from Rommel in 1942, to the

effect that if we had paid more attention to the theories of Liddell Hart we would have avoided the greatest part of our defeats. Presumably Rommel himself did imbibe those theories—and he was well and truly beaten by our negligent Generals.

The same wrapper entices us with the promise of pages of " new theories and fresh answers " to the further problems of to-day. So far as that goes, we are not disappointed ; but they relate somewhat vaguely to the " Defence of the West," and it is hardly likely that the Military Committee of the North Atlantic Treaty Organization or the Western Union Chiefs of Staff will find in this latest collection of Captain Liddell Hart's admonitions, arguments and dictums a solution to their practical problems or an infallible guide to correct strategy in a future war.

This clever and persuasive author has written so much and so variedly that he can usually quote himself to prove how right he was ; it would be tedious—but by no means difficult—to quote from his prolific writings to show how often he has been wrong. In his new book he joins forces with the self-styled " progressive officers " (those in more responsible positions are presumably static if not retrogressive) who advocate a highly mobile British Regular Army of 250,000 men (at the expense of the abolition of conscription), and suggests that from this we could provide our quota to a Western Nations' striking force of twenty first-class mobile divisions supported by a good tactical Air Force. He seems to think, with them, that if such forces were available the danger of attack by Russia would cease to exist. There will be less disposition to cavil at this " theory " than to question the effectiveness (and incidentally the fairness *vis a vis* the other two Services) of the inducements he and his fellow protagonists propose to stimulate recruiting. It is scarcely a matter for dispute that the Western Allies could not expect to stem the initial advance of Russian hordes with only conscript manpower armies ; but it has to be remembered that Britain's military requirements are not governed by the politico-military situation in Europe alone, and the young soldier is proving his worth on active service to-day in a very different part of the World.

Captain Liddell Hart with his ready pen can write with at least some appearance of knowledge and authority on land strategy, including the influence of air forces ; but when he dabbles in maritime warfare and its functions he is indeed " all at sea," and displays his ignorance again and again. He joins the small army of ill-informed critics who deride the value of the battleship in the late war, and he alludes to the Navy of to-day with its carriers and cruisers as " rather a waste of money in the absence of any serious threat on the surface of the sea." Perhaps we should not expect him to have any professional knowledge of sea warfare, but it might occur to the veriest tyro that the sinews of war are carried in surface merchant ships and that their chief enemy—the submarine, can only be countered effectively by the surface warship in conjunction with aircraft—often flown from carriers : that is elementary, but axiomatic.

This theorist again displays his ignorance of the professional attributes of the Services by advocating their combination in one. It is obvious that he has " not a glimmering " of the highly specialist training necessary for efficiency in the various branches of any one Service, or of the need for the commander to acquire sufficient technical knowledge to make the best tactical use of the weapons with which his forces are armed, be they anti-submarine, tanks or aircraft. To attempt to make officers jacks of all trades would be to produce masters of none ; to attempt to make other ranks inter-changeable as sailors, soldiers and airmen would be to produce a bewildered rabble.

This rather untidy and egotistical, not to say conceited, book can be recommended to the higher student of war because it will stimulate his imagination and sharpen his wits in extracting from all the theoretical verbiage the vital problems it does enumerate, and in testing the validity of the proposed solutions. But the younger student should be warned against its pontifical tone lest he should be led to regard it as a monument of military wisdom and, as a deduction, that most of our commanders past and present have been ignorant fools.

ARMY

The Battlefields of England. By Lieut.-Colonel A. H. Burne (with a foreword by Professor G. M. Trevelyan, O.M.). (Methuen.) 21s.

Colonel Burne has set out to accomplish two tasks. Firstly, to provide a guide whereby those who take the trouble to visit the principal fields of battle in England may follow the courses of those battles on the actual ground they were fought over. Secondly, by careful and prolonged historical research, to reconstruct the stories of those battles from a purely military point of view.

As the title implies, the author has given pride of place to his first task.

The volume covers nineteen (not twenty as stated on the jacket) battles " which have helped to mould our Island story," in as many chapters. They range from the defeat of the Saxons at Badon in about A.D. 500, to the last battle fought on English soil at Sedgemoor in 1685.

Few readers will have the time or possibly even the inclination to tour the length and breadth of England to search out these fields of battle, but that need not deter anyone from reading this work ; for the author with the aid of admirably clear sketch-maps and, in some cases, panoramas, draws a vivid picture which amply brings to life those far away events and their surroundings.

If his descriptions of the battles from the purely military point of view leave the reader less satisfied, one must attribute this to the limitations and inaccuracies of contemporary chroniclers, the comparatively recent evolution of the art of map-making and the neglect of military history by our forefathers. For the author has spared himself no pains in his task. By diligent research on the ground, in the library and, in at least one case, from the air, he has succeeded in tracing out and reconstructing the movements and positions of the opposing armies ; and from these, in the light of what he terms " inherent military probability," he builds up the story from the strategical and tactical angle.

He concludes each chapter with a post-mortem, in which he gives his reasons for differing from previous historians.

Colonel Burne's conclusions are often at variance with Sir James Ramsay—an accepted authority in these matters, and he criticizes him freely and severely.

In a volume devoted to separate and unconnected accounts of individual battles it is not easy to mark out any for special comment. The reader must be left to choose for himself. But from both the military and historical aspects his account of the Battle of Worcester in 1651, is of special interest and typical of his treatment of the whole subject.

" Worcester is unique among battles fought in England as being conditioned by a river crossing." Cromwell was faced by his adversary, Charles II, who, given the advantage of interior lines, stood on the defensive behind the River Severn and its tributary the Teme. We are shown how Cromwell, by collecting twenty " great boats " together with the necessary planks and " aquatic and terrestrial artificers," threw bridges across both rivers and successfully effected an opposed river crossing, thereby uniting the wings of his army to reap the advantage of superior numbers and morale.

Altogether there is much that the student of military history may gain from reading these accounts of ancient battles. Moreover, as Professor Trevelyan remarks, " the Colonel's estimate of the strategical and tactical qualities displayed by the commanders in the various campaigns and battles is most interesting." Typical of the author's easy style is his reconstruction of the verbal orders issued by King Harold to his two brothers on the morning of the Battle of Hastings, which contains this passage : " You may both carry out strictly limited counter-attacks, but I shall reserve my general counter-attack until I am satisfied that the enemy have shot their bolt."

The book contains in an appendix some most interesting notes on arms and armour in use at the various periods, and there is also a comprehensive bibliography of the various works consulted.

Colonel Burne is to be congratulated on producing in palatable form a book which helps to fill a gap in our national history.

Organization and Equipment for War. By Lieut.-General Sir R. Weeks, K.C.B., C.B.E., D.S.O., M.C. (Cambridge University Press.) 7s. 6d.

This small volume, based on three Knowles Lees Lectures, delivered by General Weeks at Cambridge University in 1948, is a mine of information. The early chapters describe the problems of organization and equipment which the War Office had to overcome in the years 1939-1945. The last four chapters comment on the present and future.

General Weeks sets down a number of valuable reflections, and in the first chapter enunciates seven points about which there must be no confusion of thought—obviously not only among soldiers. One is that a nation at war must have the resources to enforce national policy ; another is that there must be a clear-cut relationship between operational intentions and administrative resources. A final point is the decisive influence of the " warrior spirit."

The author, who was D.C.I.G.S. for the last three years of the War, opens with a description of what he terms the " Central Machine " and of the organization of the War Office. He has a good deal to say about the amount of leeway which had to be made up ; about the maze of committees ; and, how the machine was made to work. General Weeks explains the links established to bridge the gap between the troops in the field and the factories ; stresses the difficulties of design, estimation of quantities and production ; and discusses the various aspects of supply, including the dreadful problem of spare parts. He deals thoroughly with control of movement in war. It seems to be more than ever true that war is first and foremost a matter of movement and maintenance.

After a consideration of possible " war winners," ranging from the Spitfire to insecticides, the author touches on the thorny question of our tanks—" the subject of much criticism . . . a great deal of which was ill-informed and failed to take into account fundamental factors." These factors, of course, were the financial and other limitations imposed by our disarmament policy. The great strides made by the Germans in 1934-1939 are pointed out. They were, however, free from handicaps such as we suffered.

Did the Ministry of Defence really function as it was intended to do ? The author thinks not, and says why. One point he makes in this connection is that the Minister of Defence ought to be a man " with exceptional qualities of wisdom, judgment, knowledge and decision." Following some informative remarks on the unification of the Services, General Weeks makes some candid comments on the structure of the Army to-day ; the existing set-up, including the functions of the Ministry of Supply ; and our state of preparedness. Like many others, he does not appear to agree that all is well.

The style of this book is clear and concise, but set out in an interesting manner with some good diagrams. It can be read with profit by all officers whether they aspire to staff employment or not. It gives a clear insight into the working of the machine which, when properly fed and driven, did in fact deliver the goods. It also contains, as Field-Marshal Montgomery states in the Foreword, much food for thought on our existing weaknesses, and on future developments.

The Royal Artillery Commemoration Book, 1939-1945. Published on behalf of the R.A. Benevolent Fund by G. Bell & Sons. £5 5s.

This massive and monumental volume is a fitting memorial to, as the dedication puts it, " Those members of the Royal Regiment of Artillery who laid down their lives for King and Country in the Second World War, 1939-1945, in the service of the guns." The first feeling on seeing the book is one of astonishment that it could be produced at the same price by the same publishers, and in the same style as the Great War Commemoration Book, exactly thirty years previously. Examination of the contents increases this astonishment, for whereas the previous book contained 408 pages, this one extends to 790 pages of the same size. Our first congratulations, therefore, must logically go to Messrs.

George Bell & Sons who have, in substance, preserved the style and format of the older volume, whilst improving upon it in some ways. Then we are struck with the anonymity of the book. It is not till we reach the end of the Preface that we meet the names W. E. Duncan, H. F. Ellis, R. L. Banks and Norman Scarfe, as Joint Editors. But it is an open secret that the bulk of the work has been done by the first named; indeed Lord Alanbrooke makes this clear in his Foreword where he declares that "if it had not been for Brigadier Duncan's untiring energy, dogged determination and boundless devotion to his task, I am convinced that this book would never have seen the light of day." Those who have been in any way behind the scenes during the composition of the work will endorse this sentiment.

Now as to the contents. Although comparisons are notoriously odious, it may be convenient to compare the two books feature by feature. As we have said, the general format is the same. In this matter the editors have shown good sense, for the previous volume invoked almost universal praise for its general lay-out. There are naturally slight differences of detail. The old volume was chronological throughout; the new one takes each campaign in turn, for the late war lends itself better to this treatment. Moreover there were more theatres of war to be chronicled—more even than the book deals with, for the short campaign in Crete is omitted: that is a pity, for there was at least one episode deserving immortality—the duel between Lieutenant Lashmar and a handful of gunners against the German paratroop landings. These campaigns are almost all recorded by Gunners about Gunners, which is as it should be. Naturally the standard of writing varies, and there is no attempt at polished prose passages. In the section devoted to Leaders and Planners, however, it was right to go outside the Regiment occasionally. Thus we have an appreciation of Lord Alanbrooke by Dr. Arthur Bryant, of Sir Robert Gordon-Finlayson by Lord Alexander, and of Generals Lindsell and Pownall by the late Lord Wavell.

In general, the editors have cast their net wider than in the first volume. Room has been found for articles on the O.C.T.U.'s, "Gunners round the Empire," "Our Fathers Also," "Woolwich—the Home of the Regiment," and Artillery House.

There is one feature in which this volume is weak: there is very little poetry. No doubt the editors were right to be ruthless and to reject all but the best, but it is hard to believe that the poetic fount is so dry in the Regiment as this book would lead us to suppose. There is a stirring poem on 155 Field Battery that appeared originally in *The Gunner;* and one on "The Shop" by Dum-Dum from *Punch*, but singularly little original work. Poetry is often a solace in bereavement, and this was recognized by the inclusion of a large number of poems in the old volume.

Finally we come to the illustrations. These take the form of maps, coloured plates, photographs and black and white sketches. The difficult problem of the maps has on the whole been satisfactorily solved, though we could have done with more of them. Of course the answer will be that this is not a history but a commemoration book. At any rate the maps that we do get are admirable, and mostly in colours. The coloured plates are also well-produced, though it is questionable whether they come up to the exceptionally high standard of the old volume.

Last of all, there are the photographs of individuals. Here there were plenty of snags. Once you admit the principle of publishing photographs of individuals still living the task of selection becomes difficult, if not invidious. The more you print, in an endeavour not to incur any bad omissions, the more individuals you are liable to estrange who consider that they have a prior claim to some of those selected. Here the editors have shown their daring, for whereas the old volume was content with 31 photographs the new one contains over three hundred—evidently too many to include in the list of contents. The task of selection was only one of the many that confronted Brigadier Duncan and his team, and the verdict must be that these tasks have been well and truly performed and that the resulting volume is worthy of its noble purpose.

ADDITIONS TO THE LIBRARY

(*Books for Reference in the Library only)

GENERAL

DOCUMENTS ON BRITISH FOREIGN POLICY, 1919–1939. Second Series, Volume IV, 1932–3. Edited by E. L. Woodward and Rohan Butler, assisted by Margaret Lambert. Royal 8vo. 565 pages. (H.M.S.O., 1950.) 25s.

UNITED KINGDOM POLICY. Foreign, Strategic, Economic. Appreciations by Professor Sir Charles Webster, Major-General Sir Ian Jacob and E. A. G. Robinson. Crown 8vo. 101 pages. (R.I.I.A., 1950.) 4s.

THE ADAPTABLE COMMONWEALTH. A Summary of the Proceedings of the Commonwealth Relations Conference, 1949, held at Bigwin Inn, Ontario, Canada, 8–18 September, 1949. By F. H. Soward. Crown 8vo. 62 pages. (R.I.I.A., 1950.) 2s.

ORGANIZATION AND EQUIPMENT FOR WAR. By Lieut.-General Sir Ronald M. Weeks. Crown 8vo. 132 pages. (Cambridge University Press, 1950.) 7s. 6d. Presented by the Publishers. (See Review in this JOURNAL.)

IMPERIAL MILITARY GEOGRAPHY. By Brigadier D. H. Cole. Demy 8vo. 318 pages. (Sifton Praed, Tenth Edition, 1950.) 24s. Presented by the Publishers. (See Review in the JOURNAL of last quarter.)

WAR OR PEACE. By John Foster Dulles. Demy 8vo. 274 pages. (Harrap, 1950.) 15s.

DEFENCE OF THE WEST. Some Riddles of War and Peace. By B. H. Liddell Hart. Crown 8vo. 390 pages. (Cassell, 1950.) 12s. 6d. Presented by the Publishers. (See Review in this JOURNAL.)

PORT OPERATION AND ADMINISTRATION. By A. H. J. Bown and Lieut.-Colonel C. A. Dove. Demy 8vo. 295 pages. (Chapman and Hall, 1950.) 21s.

THE BATTLEFIELDS OF ENGLAND. By Lieut.-Colonel Alfred H. Burne. Demy 8vo. 315 pages. (Methuen, 1950.) 21s. Presented by the Publishers. (See Review in this JOURNAL.)

ENGLISHMEN WITH SWORDS. A narrative of the years 1647, 1648 and 1649, taken from the journal of Gilbert Mabbot. By Montagu Slater. Large Post 8vo. 190 pages. (Bodley Head, 1949.) 10s. 6d.

A SHORT HISTORY OF CANADA. By G. P. de T. Glazebrook. Crown 8vo. 238 pages. (Oxford University Press, 1950.) 10s. 6d.

A HISTORY OF THE ISLAND OF JERSEY. From the Cave Men to the German Occupation and after. By G. R. Balleine. Demy 8vo. 341 pages. (Staples Press, 1950.) 30s.

AN INVASION THAT FAILED. The French Expedition to Ireland, 1796. By Commander E. H. Stuart Jones, R.N. Demy 8vo. 256 pages. (Blackwell, 1950.) 21s. Presented by the Publishers.

JERUSALEM EMBATTLED. A Diary of the City under Siege, March 25th, 1948, to July 18th, 1948. By Harry Levin. Large Post 8vo. 288 pages. (Gollancz, 1950.) 12s. 6d.

FINLAND. The Adventures of a Small Power. By Hugh Shearman. Demy 8vo. 114 pages. (Stevens, 1950.) 10s. 6d.

*PAPERS RELATING TO MILITARY OPERATIONS IN AFGHANISTAN. Presented to both Houses of Parliament, by Command of Her Majesty, 1843. Demy 8vo. 526 pages. (William Rushton, Calcutta, 1843.) Presented by R. D. Trotter, Esq.

THE MAKING OF PAKISTAN. By Richard Symonds. Demy 8vo. 227 pages. (Faber, 1950.) 12s. 6d.

*TOURS IN UPPER INDIA and in Parts of the Himalaya Mountains; with Accounts of the Courts of the Native Princes, etc. 2 volumes. By Major Archer. Demy 8vo. 387/356 pages. (Richard Bentley, 1833.) Presented by R. D. Trotter, Esq.

MOSCOW MISSION, 1946–1949. By Lieut.-General Walter Bedell Smith. Demy 8vo. 337 pages. (Heinemann, 1950.) 15s.

I WAS THERE. The personal story of the Chief of Staff to Presidents Roosevelt and Truman based on his notes and diaries made at the time. By Fleet Admiral William D. Leahy. Demy 8vo. 592 pages. (Gollancz, 1950.) 25s.

WHEN GREEK MEETS GREEK. By Sir Reginald Leeper. Large Post 8vo. 244 pages. (Chatto and Windus, 1950.) 12s. 6d.

I WALKED ALONE. By The Earl of Cardigan. Demy 8vo. 206 pages. (Routledge and Kegan Paul, 1950.) 12s. 6d.

BROKEN THREAD. An Autobiography. By Major-General F. S. G. Piggott. Demy 8vo. 424 pages. (Gale and Polden, 1950.) 21s. Presented by the Publishers. (See Review in this JOURNAL.)

ELEPHANT BILL. By Lieut.-Colonel J. H. Williams. Demy 8vo. 320 pages. (Rupert Hart-Davis, 1950.) 18s.

MEMOIRS OF KING ABDULLAH OF TRANSJORDAN. Edited by Philip P. Graves. Large Post 8vo. 278 pages. (Cape, 1950.) 15s.

*THE LIFE OF NAPOLEON BUONAPARTE, EMPEROR OF THE FRENCH. With a preliminary view of the French Revolution. 9 volumes. By Sir Walter Scott. Crown 8vo. (Longman, 1827.) Presented by R. D. Trotter, Esq.

ARABIAN JOURNEY. And other Desert Travels. By Gerald de Gaury. Large Post 8vo. 190 pages. (Harrap, 1950.) 12s. 6d.

THE KON-TIKI EXPEDITION. By Raft across the South Seas. By Thor Heyerdahl. Demy 8vo. 235 pages. (Allen and Unwin, 1950.) 12s. 6d.

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THE THINGS WE SEE: SHIPS. By David Pye. Foolscap 4to. 64 pages. (Penguin Books, 1950.) 2s. 6d.

SILENT SENTINELS. By Commander R. Langton-Jones, R.N. Crown 8vo. 232 pages. (Muller, Second Edition, 1950.) 7s. 6d. Present by the Author.

This is a treatise on lighthouses and covers their history from the time when wood and coal braziers were kindled to keep mariners away from rock and reef, up to the present day. It deals especially with the Lighthouse Service in the Bahamas.

FAMOUS PADDLE STEAMERS. By F. C. Hambleton. Medium 8vo. 96 pages. (Marshall, 1948.) Presented by Lieutenant-Commander F. A. Smyth, R.D., R.N.R.

THE CRUISE OF THE AMARYLLIS. By G. H. P. Muhlhauser. Crown 8vo. 317 pages. (Rupert Hart-Davis, Second Edition, 1950.) 9s. 6d.

*THE ANNUAL REGISTER. A review of public events at home and abroad for the year 1949. Edited by Ivison S. Macadam. Demy 8vo. 524 pages. (Longmans, 1950.) 50s.

POCKET ENCYCLOPEDIA OF ATOMIC ENERGY. Edited by Frank Gaynor. Demy 8vo. 204 pages. (Philosophical Library, New York, 1950.) $7.50. Presented by the Publishers.

SECRET SERVICE UNMASKED. By Tristan Busch. Demy 8vo. 272 pages. (Hutchinson, 1950.) 16s.

THE GROUNDNUT AFFAIR. By Alan Wood. Large Post 8vo. 264 pages. (Bodley Head, 1950.) 12s. 6d.

*THE HISTORY OF THE VICTORIA CROSS. By Philip A. Wilkins. Large Post 4to. 443 pages. (Constable, 1904.) Presented by The Royal Norfolk Regiment Association.

THE SCOUT MOVEMENT. By E. E. Reynolds. Demy 8vo. 234 pages. (Oxford University Press, 1950.) 15s. Presented by the Publishers.

THE DESOLATE ANTARCTIC. By Admiral Lord Mountevans. Demy 8vo. 172 pages. (Lutterworth Press, 1950.) 12s. 6d.

*ATLAS INTERNATIONAL LAROUSSE. Politique et Economique. Compiled by Jean Chardonnet. Imperial folio. (Librairie Larousse, Paris, 1950. English Agents, Harrap.) 7 gns. Presented by the Publishers. (See Review in this JOURNAL.)

THE SECOND WORLD WAR. Volume III. THE GRAND ALLIANCE. By Winston S. Churchill. Demy 8vo. 818 pages. (Cassell, 1950.) 25s.

This volume covers the year 1941 when early victory in Cyrenaica was followed by defeat in Greece and Crete, the revolt in Iraq and the sinking of the Bismarck. Russia was invaded in June, the Atlantic Charter was declared in July, the Japanese attacked Pearl Harbour in December and the Grand Alliance was begun.

HISTORY OF UNITED STATES NAVAL OPERATIONS IN WORLD WAR II. Volume V. THE STRUGGLE FOR GUADALCANAL. August, 1942–February, 1943. By Samuel Eliot Morison. Demy 8vo. 389 pages. (Geoffrey Cumberlege, Oxford University Press, 1949.) 48s. Presented by the Publishers. (See Review in this JOURNAL.)

THE RISE OF RUSSIA IN ASIA. By David J. Dallin. Large post 8vo. 293 pages. (Hollis and Carter, 1950.) 18s.

This book completes the same author's "Soviet Russia and the Far East" published in 1949. Korea is mentioned in the first line of the first page, and Russia's interest in that Country and in China, first under the Tsars and equally under the Soviet, forms the theme of the work.

NAVAL

THE ROYAL NAVAL COLLEGE, DARTMOUTH. By E. A. Hughes. Medium 8vo. 175 pages. (Winchester Publications, 1950.) 15s.

MERS-EL-KEBIR. By Pierre Varillon. Demy 8vo. 230 pages. (Amiot-Dumont, Paris, 1949.) Presented by Captain the Hon. D. H. Erskine.

PATTEE BYNG'S JOURNAL, 1718–1720. Edited by J. L. Cranmer-Byng. Medium 8vo. 311 pages. (Navy Records Society, 1950.) 21s.

THE STONE SHIPS EXPEDITION AGAINST BOULOGNE, 1804. By T. H. McGuffie. Pamphlet. 15 pages. (Reprinted from *The English Historical Review*, October, 1949.) Presented by the Author.

*THE HISTORY OF THE AMERICAN SAILING NAVY. The Ships and their Development. By Howard I. Chapelle. Crown 4to. 558 pages. (Norton, New York, 1949.) $12.50.

ARMY

*HISTORY OF THE KING'S DRAGOON GUARDS, 1938–1945. By Colonel D. McCorquodale, Major B. L. B. Hutchings and Major A. D. Woozley. Edited by Major A. D. Woozley. Demy 8vo. 403 pages. (Published privately, 1950.) Presented by the King's Dragoon Guards History Committee.

*HISTORY OF THE LIGHT INFANTRY BRIGADE. Crown 8vo. 58 pages. (Gale and Polden. 1948.) Presented by The Light Infantry Club.

*THE NEW ROMNEY FENCIBLE CAVALRY (DUKE OF YORK'S OWN), 1794 TO 1800. By Colonel E. A. C. Fazan. Pamphlet. 10 pages. (Reprinted from *Archæologia Cantiana*, Volume LXII.) Presented by the Author.

*THE HADHRAMI Bedouin Legion. By A. M. Clark Hutchison. Pamphlet. 4 pages. (Reprinted from the *Royal Central Asian Society Journal*, 1950.) Presented by the Author.

*"No Dishonourable Name." The 2nd and 3rd Battalions Coldstream Guards, 1939–1946. Compiled and edited by D. C. Quilter. Demy 4to. 334 pages. (Clowes, Second Edition, 1948.) Presented by Major R. F. Mortimer.

*The Royal Artillery Commemoration Book, 1939–1945. Medium 4to. 790 pages. (Bell, 1950.) 105s. Presented by the Publishers at the request of the Joint Editors. (See Review in this Journal.)

*Ubique: War Services of all the Officers of H.M's Bengal Army. Compiled by Captain T. C. Anderson. Large Post 8vo. 668 pages. (Published privately, 1863.) Presented by R. D. Trotter, Esq.

*Military Customs. By Major T. J. Edwards. Crown 8vo. 173 pages. (Gale and Polden, Second Edition, 1950.) 10s. 6d.

African Trilogy. Comprising Mediterranean Front, A Year of Battle, The End in Africa. A personal account of the three years' struggle against the Axis in the Middle East and North Africa, 1940–3. By Alan Moorehead. Large Post 8vo. 592 pages. (Hamish Hamilton, 1945.) 18s.

Keep the Memory Green. The First of the Many. France, 1939–40. By Lieut.-Colonel Ewan Butler and Major J. Selby Bradford. Demy 8vo. 180 pages. (Hutchinson, 1950.) 12s. 6d. Presented by the Publishers.

There's No Home. By Alexander Baron. Crown 8vo. 223 pages. (Cape, 1950.) 9s. 6d. Presented by Captain J. C. Ledward.

A novel of life in an infantry battalion behind the line in Italy during the Second World War.

The Story of Zarak Khan. By A. J. Bevan. Demy 8vo. 176 pages. (Jarrolds, 1950.) 15s.

*Fourth Indian Division. By Lieut.-Colonel G. R. Stevens. Medium 8vo. 431 pages. (McLaren, Canada, n.d.) 24s.

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AIR

*The Army Air Forces in World War II. Volume II. Europe: Torch to Pointblank. August, 1942, to December, 1943. Edited by Wesley Frank Craven and James Lea Cate. Royal 8vo. 897 pages. (University of Chicago Press, 1949.) 45s.

The Brereton Diaries. The War in the Air in the Pacific, Middle East and Europe. 3rd October, 1941–8th May, 1945. By Lieut.-General Lewis H. Brereton, U.S.A. Demy 8vo. 450 pages. (Morrow, New York, 1946.) 45s.

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